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Report of the Special Committee for the Detection of Glanders*

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AT THE 49th annual meeting of the American Veterinary Medical Association by a "motion duly seconded and passed" it was voted to recommend to the Association that the incoming president appoint a committee to investigate modern diagnostic methods for the detection of glanders and reach an understanding as to the best method for the reduction of glanders.

After a meeting of three of the members of the committee February 15, 1913 it was decided to adopt the following outline, of the manner in which the study of the disease glanders may be duly covered.

Glanders

1. Cause, variation in virulence.
2. Animals susceptible.
3. Period of incubation.
4. Modes of infection.
5. Manifestations—symptoms—prognosis.
6. Diagnosis:
   - Mallein—subcutaneous, ophthalmic, cutaneous.
   - Laboratory, cultural—animal inoculation test.
   - Blood test—opsonin, conglutination, precipitation.
   - Agglutination, complement fixation.
7. Differential diagnosis—clinical laboratory.
8. Pathological anatomy.
9. Quarantine—clinical, occult and exposed cases.
10. Disposition—clinical, occult and exposed cases.
11. Treatment.
12. Disinfection.
13. Retesting and subsequent control.
14. Regulations state and Federal.

The committee understood that its duties were to be confined to the study of the modern diagnostic methods and reach an understanding as to the best method for the reduction of glanders.

Prior to the discovery of the bacillus mallei as the specific cause of glanders by Loeffler and Schutz in 1882, the diagnosis rested entirely upon clinical observations. The symptoms of the disease are perhaps better differentiated at this time but in the main the general picture of the clinical case is unchanged.

Since then more tests and methods of more or less diagnostic value have revealed themselves than in any other infectious disease of animals, which may be tabulated as follows:

1. *Clinical Diagnosis.*
2. *Mallein Tests.*
   - A. Subcutaneous Mallein Test.
   - B. Ophthalmic Mallein Test.
   - C. Cutaneous Mallein Test.
     1. Cutaneous.
     2. Dermal.
     3. Endermal.

*Presented at the 50th Annual Meeting, A. V. M. A., New York, September, 1913.

3. *Laboratory Diagnostic Methods.*

A. Examination of Pus or Nasal Discharge.

1. Microscopic.
2. Cultural.
3. Animal Inoculation Test.

B. Examination of Blood.

1. Opsonin, Conglutination or Precipitation Test.
2. Agglutination Test.
3. Complement Fixation Test.

1. *Clinical Diagnosis.*

Without going into details the cardinal manifestations may be enumerated as follows: Characteristic nasal discharge; nodule ulceration; enlargement of submaxillary glands; cording of the lymphatics and fluctuation in temperature range.

2. *Mallein Tests.*

Mallein, the toxic substances produced in cultures of the bacillus mallei, was discovered by Hellman and Kalning in 1891. Pearson, working independently, prepared mallein and further proved that mallein like tuberculin, produces a temperature rise in sensitized infected animals.

In that the preparation of mallein varies greatly and the final product differs considerably, it is suggested that the name mallein like tuberculin, abortin and kindred preparations be reserved to the final product obtained in the following way: One or more highly virulent strains that will produce orchitis in a guinea pig in 24 hours following intraperitoneal injection and death in 14 days following subcutaneous injection, transferred to +1.5 glycerin, peptone bouillon and incubated no less than six weeks at 37°C.

The purity of the cultures and virulence of the strains should be proved before sterilizing the glycerin peptone bouillon cultures. After filtering out the killed bacilli and determining the exact volume of the filtrate, the filtrate concentrated to 1-10 its original volume over a water bath represents *concentrated mallein* or *mallein.*

Mallein solution as used in the subcutaneous test is mallein diluted with 0.5 percent carbolized salt solution.

Precipitated or Purified Mallein is the dry powder obtained from mallein, precipitated with many volumes of absolute alcohol. After filtering out the precipitate, re-dissolving in normal salt solution and washing repeatedly with alcohol (absolute) the precipitate is finally dried over calcium chloride or sulphuric acid. A five percent solution is generally used.

The Mallein prepared of any one or more strains of bacillus mallei should be tried out on sensitized animals before it is relied upon in actual tests.

Even though the exact composition of the active principle of mallein remains unknown, the specificity of the reaction in sensitized animals is established beyond question.

Subcutaneous Mallein Tests

This is the oldest of the mallein tests, is reliable when properly carried out and interpreted. It consists of the injection of mallein solution which in sensitized animals will produce characteristic temperature rise, local and general reaction.

A characteristic temperature rise begins in from 4 to 8 hours and the maximum temperature is reached in from 10 to 20 hours with a gradual return to normal.

At least two temperatures should be taken before the injection of mallein solution 3 hours apart and five temperatures after the injection beginning not later than the 10th hour and continuing to the 20th hour at intervals of not less than two hours.

The least difference between the before and after temperatures should be 2.5°F. with the temperature rising to 103°F. or above.

Local Reaction

Several hours after injection a hot painful edematous swelling develops which may persist for several days, enlarging considerably and gradually disappearing.

Normal horses may show a local swelling which will not enlarge and rapidly disappears.

General Reaction

Lessened appetite, dullness, staring coat, muscle tremors, respiratory difficulties, altered pulse rate, all of which may or may not be present.

Ophthalmic Mallein Reaction

This test has the advantage in that it is simple and easy to apply.

Application of Test

A. Before applying the test, examine the eye for conjunctivitis or purulent change. Should a conjuctivitis exist the eye test should not be tried.

B. Take temperatures before the ophthalmic test. Fever need not hinder the test.

C. Place 4 to 5 drops (0.1 to 0.2 for one test) of undiluted mallein or 5 per cent solution of precipitated mallein within the lower eye lid with a dropper, glass rod, or camel's-hair brush. The other eye is left untouched to serve as control. Same brush or glass rod may be used from animal to animal.

D. As soon as the mallein is applied a flow of tears nearly always appears with reddening of the conjunctiva and photophobia. These phenomena have no significance and disappear in several hours.

E. The characteristic manifestations of a positive reaction begin 5 to 6 hours and last 36 to 48 hours, sometimes longer. ***A purlent secretion or discharge with reddening of the conjunctiva alone is significant of a positive reaction.*** Swelling and gluing of eye lids may be seen in severe reactions.

F. The eye should be examined and compared in good light 16 to 18 hours after the application of the test, The conjunctiva and the eyeball should also be included in the examination after noting the discharge.

Generally the positive reaction is not accompanied by temperature rise or general reaction. The temperature variation does not occur in negative tests or normal animals. In positive reactions the rise may be observed in taking the temperature twice, the first time when the test is applied and the second when the readings are made 16 to 18 hours later.

G. The results of the test to be interpreted and recorded as follows:

1. Negative, N, eye unchanged.
2. Suspicious, S. sero-mucous discharge.
3. Positive, P + sero-mucous discharge, with purulent flakes.
4. Positive, P ++ distinct purulent discharge.
5. Positive, P +++ a purulent discharge with swelling of the lower eye lid.
6. Positive, P ++++ strong purulent discharge with gluing together of both lids.

H. If the result of the test is negative or questionable 24 hours after the first application the test may be repeated at once on same eye or the control eye. If repetition also negative or questionable the test may be repeated in three weeks.

I. The intensity of the ophthalmic reaction bears no relation to the stage or development of the infection.

Cutaneous Mallein Test

In the cutaneous-dermo-endermal mallein tests, the concentrated mallein is applied with a knife or vaccination needle; rubbed into a shaved area or injected into the skin. In the latter test a highly diluted mallein is used in preference to a concentrated mallein.

In positive cases a spreading, warm, painful, and edematous swelling will be observed in 24 hours.

The reactions are positive when the distinct visible swellings in contrast to the unaffected control areas develop. In severe reactions vesicular eruptions may appear.

In that the skin tests are complicated requiring special instruments, skill and practice they are not considered practical.

Laboratory Diagnostic Methods

The demonstration of the organism in smears in the microscopic examination and isolation of the organism culturally—or the demonstration of the infection in the injection of the suspected material into a male guinea pig resulting in a typical Strauss reaction is positive evidence of the disease, but the absence of these findings or negative animal inoculation test does warrant a negative diagnosis.

Examination of Serum.—1. Opsonin, conglutination or precipitation tests. The first have proved laborious and impracticable and the latter unreliable.

2. Agglutination Test.

Depends upon the power of the undiluted immune serum to clump bacteria suspended in carbolized salt solution. The presence of agglutinins is determined quantatively in using measured amounts of serum and test fluid.

Readings to be made after incubating the tubes for 1-2 hour at 37°C centrifugalizing at 1600 revolutions for 10 minutes and allowing tubes to stand at room temperature for two hours.

The same results may be obtained in allowing the tubes to incubate at 37°C for 24 hours and to stand at room temperature for 12 hours more.

The appearance of a veil-like membrane with turned in edges or small clumps or flakes of grayish white or brownish at the bottom of the tube may be regarded as positive agglutination.

Sharply circumscribed sediment in the center of the tube with shape of lentil seeds indicates the absence of the agglutination in centralifugalized tubes.

The agglutination value of over 1-1000 is indicative of glanders but since high agglutination titres are obtained only in the acute form of the disease it is advisable to combine this test with the complement-fixation test and not make the diagnosis on this test alone.

Complement-Fixation Test

This is the most complicated of the tests and must be considered purely a laboratory diagnostic method requiring careful technique. Like the agglutination test it is quantitative reaction in which the affinity of the human bodies in the serum of an affected animal to the glanders antigen is utilized for the phenomena of the reaction in which the following play a part: Complement=normal guinea pig serum; sheep rabbit amboceptor=sensitized rabbit serum with washed red blood corpuscles of sheep; glanders antigen=shake extract of killed glanders bacilli; sheep corpuscles and the clear serum of the suspected animal.

The results of the test should be interpreted as follows:

1. Horses in which the serum produces a complete fixation of the complement in the quantities of 0.1 Cc. and 0.2 Cc. should be considered as glandered.

Horses in which the serum gives a complete fixation in the quantity of 0.2 Cc. and an incomplete fixation in the quantity of 0.1 Cc. should likewise be considered as glandered.

3. Horses in which the serum produces an incomplete fixation of the complement in the quantities of 0.1 Cc. and 0.2 Cc. should also be considered glandered.

4. Horses in which the serum shows no fixation of the complement in either tube should be considered free of glanders.

The value of any diagnostic method cannot be accurately estimated or judged, unless autopsies are made by a carefully trained veterinarian of all animals tested that die or are destroyed. Macroscopic examinations are not sufficient with the presence of atypical lesions.

Unless typical lesions are present, histological and bacteriological examinations must be resorted to.

In deciding upon a method which would be the most satisfactory for the diagnosis of glanders, the simplicity, reliability and trustworthiness of the method must be above reproach.

The results should manifest themselves as soon as possible, the reaction should be well marked and distinct and easily applicable by the average practicing veterinarian.

A test with these requirements places a test into the hands of the practicing veterinarian along with which the standing of the veterinarian in the community and the confidence of the public to the veterinarian is brought into closer relationship in that it enables the veterinarian to personally decide on the results of the test.

The ophthalmic test not only meets all these requirements but is without doubt the most convenient diagnostic method at our command.

Its reliability compares favorably with any of the other available tests.

The reaction is usually very distinct, and doubtful or atypical reactions are rather infrequent.

The ophthalmic test does not interfere

with subsequent serum or other mallein tests if such are deemed necessary.

The test may be repeated within 24 hours on same or control eye, and final retest in not less than three weeks.

The ophthalmic test should be recognized by state and federal authorities, since its reliability can no longer be doubted.

In all atypical and doubtful cases of the ophthalmic test the combined complement-fixation and agglutination or subcutaneous mallein tests should be utilized for confirmation. Such a procedure should minimize the failures and assure the best results in the control of the disease in a single stable or in an entire community.

Appearance of the Reaction of the Various Tests After Infection.—Agglutinins reach their appearance in from 4 to 5 days and continue to increase in the early stages of the disease and diminish as the disease becomes chronic.

Specific amboceptors of the complement-fixation test may be demonstrated in from 7 to 10 days in quantities of diagnostic value and their presence may be demonstrated during the entire course of the disease.

Subcutaneous Mallein Test may as a rule be relied upon 15 days after infection.

Ophthalmic Mallein Test may be relied upon three weeks after infection.

Effect of One Test on the Others

All blood serum tests are influenced in 3 to 6 days after a subcutaneous injection of mallein or any glanders antigen including glanders vaccines for a period varying from 6 to 8 weeks following injection of mallein and up to 3 months and even longer following injection of glanders antigen or vaccines. All blood samples therefore should be taken prior to or at the time of the mallein injections.

(*Continued on page 623.*)

Mammitis or Mastitis in Cows

By GEORGE LOCKWOOD, M. R. C. V. S., Peterborough, England

(*Continued from page 523, October issue.*)

THE *blood stream.* Infection by this mean is probably rare, though it appears possible. It also seems possible that when the disease is widely spread, or conditions are favorable for the transmission of the specific microbe, mastitis may take an epizootic form, the infected material being easily carried from animal to animal during milking. It is not astonishing considering the varying virulence of pathogenic microbes, that many different forms of udder infection occur, so that sometimes only slight irritation sometimes severe inflammation, or sometimes even gangrene results.

The acute inflammatory processes in the udder are divided in two groups, namely: Inflammation of the stroma, the interstitial tissue of the gland which again is divided into two groups—the traumatic and the phlegmonous. Inflammation of the parenchyma of the gland and of the lining membrane of the milk ducts.

Inflammatory processes confined to the surface of the milk canals are somewhat similar to catarrh of the mucous membranes. Where, on the other hand, they extend to deeper tissues they lead to abscess formation or gangrene. So that inflammation of the parenchyma of the udder may be divided into three forms; the catarrhal, the pustular, and the gangrenous. Considering the intimate relationship between the parenchyma and the stroma of the gland, it is scarcely surprising that acute inflammatory processes often extend from one to the other, and that in inflammation of the parenchyma the stroma is sometimes affected, and in diseases of the stroma the parenchyma often suffers. The former occurs the more readily because the blood vessels of the udder ramify, without exception, in the stroma. Although no sharp line can be drawn between disease of the parenchyma and those of the stroma, it is yet generally possible, having regard to the

development and course of the disease, to indicate its point of origin and clinically to observe this point of distinction, which affords exceedingly important indication both for the treatment and prognosis of the disease.

Traumatic mastitis. Only surface injuries remain confined to the connective tissue of the udder, the deeper reaching involve the real gland tissue. Cattle are particularly exposed to injuries of this kind.

Phlegmonous mastitis. This disease, previously described as superficial inflammation of the udder, affects the skin, subcutis, and interstitial connective tissue. It generally starts from the teats which in the cow very frequently suffer from surface injuries, the rough hands of the milker abrading the skin and possibly conveying infectious material; the straw with which the cow is bedded may also cause injury and infection. The microorganisms first enter the skin and subcutis and set up inflammation, which generally extends to the capsule and the stroma of the gland. The process therefore, seldom remains confined to one quarter, but extends to several, or may even attack the whole udder. The isolated course of the lymph vessels of the separate teats sometimes causes the diseases to remain confined to single sections of the gland. The skin and subcutaneous tissue are at first edematous, and later become infiltrated with plastic material, slight exudation of blood is not uncommon. We have to deal then with an erysipelatous or phlegmonous disease of which the skin or subcutaneous tissue forms the special seat.

Symptoms and course. The condition is introduced by redness and swelling which are generally diffuse, and seldom limited to particular portions of the gland. It appears suddenly, and the skin is injected; at first it appears bright, and afterwards bluish. The swelling is then soft and doughy, but later becomes hard and firm and requires some force to indent it. The skin is often exceedingly hot but pain, as in subcutaneous inflammation, is seldom severe, nor does the milk show much change in quality, though the quantity certainly falls off. At the outset, slight fever is present; the lymph glands of the udder swell and the tumefaction spreads. The condition may disappear in from four to eight days, the symptoms gradually recede, the redness disappears, the swelling subsides, and the milk secretion become normal. In other cases abscesses form. In or just beneath the skin less frequently in the superficial portions of the gland, several fluctuating points develop, which after a short time, break and discharge pus. Such abscesses are distinguished from those occurring during parenchymatous mastitis by the superficial position and slight size. This disease may also lead to other complications like gangrenous inflammation.

Differential Diagnosis. The present affection is distinguished from diseases of the parenchyma by the little change in the milk, by the implication of several sections of the udder, and by the marked simultaneous changes in the skin. It is more likely to be mistaken for the edema occurring in the udder at the time of parturition. In the latter condition, however, the well-developed inflammatory symptoms, such as heat, redness and pain are wanting.

Causes. We clearly have to deal with phlegmonous or erysipelatous inflammation, caused by infection through slight fissures and cracks in the skin, particularly of the teats. The disease is probably caused by pyogenic cocci or other microbes. Kitt produced the disease in cows by infesting with the bacillus of malignant edema.

The Prognosis depends on the virulence of the microorganisms, as shown by the violence with which the process develops, and by the degree of the general disturbance, particularly of fever. As a rule the process is benign, but abscess formation prolongs it.

Treatment is similar to that in phlegmonous conditions in other parts of the body. Cold applications are contraindicated, and the best results follow the application with slight friction of mild liniments, such as the ordinary Lin. saponis. The parts may also be washed with lukewarm solutions of disinfectants, especially if the teats are injured. The udder must be kept warm, and may be covered with wadding to assist resolution. Local injuries must be kept as

clean as possible by washing with an antiseptic lotion; after which they are smeared with any suitable material, such as boric acid ointment. It is also advisable to administer occasional small doses of some reliable saline aperient or laxative during the course of the disease.

Parenchymatous Inflammation of the Udder

This term is not quite correct, for strictly speaking the parenchyma only consists of the alveoli and their epithelium, whilst we include in this group the diseases of the milk canals and galactophorous sinuses. Not infrequently the inflammation is confined to the galactophorous sinus and the larger milk ducts, a condition comparable to bronchitis, which condition some authorities term catarrh of the udder. In other cases it extends to the alveoli and stroma, and leads to pus, or abscess formation, or gangrene. We therefore recognize three forms of parenchymatous inflammation of the udder, the catarrhal, the pustular, and the gangrenous.

Catarrh of the udder. This disease consists of inflammation of the lining membrane of the milk ducts. Sometimes the galactophorous sinuses alone suffer, but generally the large milk ducts are also attacked. The process may also extend to the smaller milk ducts and even into the alveoli of the gland. If the process is confined to the galactophorous sinus and larger milk ducts, the quantity of milk secreted is little diminished, though as inflammatory exudate from the diseased mucous membrane is mixed with it, the quality may be considerably altered. The more the small ducts and alveoli are involved, the greater the diminution and change in the milk. In consequence the disease by no means offers a constant train of symptoms.

Symptoms and progress. The surface of the udder is little changed, swelling is entirely wanting, while the redness may be slight, but pain in the depths can be detected on pressure and by the sensitiveness shown during milking. General condition is little altered. The principal changes are to be found in the milk, which contains clots of various sizes and often drops of fat. After standing for some time the milk may show a yellowish covering, or sometimes it may be reddish in color from admixture of blood. The reaction is generally normal, but it may be acid or excessively alkaline. The process sets in suddenly and attacks sometimes only one and at other times several sections of the udder. In most cases it disappears in a few days, the milk becoming normal. Sometimes, however, it takes a chronic character, the milk retains its abnormal appearance and may be mixed with pus, whilst the mucous membrane of the galactophorous sinus gradually becomes thickened and feels on palpation like a firm cord, while the swelling extends from the sinus into the other parts of the gland. Should the process in the smaller milk ducts become chronic, it causes localized thickening and induration of the udder. In other cases the inflammation leads to stenosis or occlusion of the milk ducts, with change in the affected sections of the gland, the induration extending as far as the skin. Abscess formation however is not often seen.

Prognosis depends principally on the course of the disease, the longer it has lasted the less the chance of complete recovery. In some cases the function of the udder may be destroyed for the whole of one lactation period. The outlook becomes very grave when extensive thickening and hardening take place, and even small thickenings may cause trouble on account of their forming new points of origin for the disease at the next milking period.

Causes. Without doubt the disease may be caused by chills, or by chemical decomposition or other change in the milk while in the udder, causing it to become irritant. The fact that it is generally confined to one section of the udder indicates its origin through the sinuses. It is probably due to invasion by microorganisms of slight virulence, which find a favorable soil in the milk. Opportunities for such infection are very frequent and this disease is often seen widely disseminated, being carried by the milkers from one animal to another. Microbes have been directly recognized in the diseases under or in the milk and the disease produced by injection of pure cultures. Nocard and Mollereau recognized

streptococci as the cause of the disease, whilst Bang thought that staphylococci produced it. Hock saw the affection during the course of foot-and-mouth disease. Several portions of the udder were often simultaneously affected.

Treatment. With a view to prevention the greatest care should be taken against introducing infected probes, bougies, milk catheters, etc., into the mammary ducts and galctophorous sinuses. In enzootic outbreaks it is advisable to isolate the diseased and provide against transmission of infection by the milker's hands. Beyond combating inflammation, little more can be done. It is very important however to withdraw the milk frequently and at such times massage will be found to assist the discharge of secretion from the smaller milk ducts. The diseased udder must be kept warm, and where the disease is clearly infectious, antispetics may be injected.

Purulent Inflammation of the Udder

In this form the inflammation also originates in the milk ducts and alveoli, but instead of remaining confined to their surface it spreads to the depths and to the interstitial connective tissue. The purulent catarrh affecting the lining membrane of the milk ducts is accompanied by phlegmonous inflammation of the connective tissue substance of the stroma of the gland. Franck was first to produce the disease experimentally, by injecting a decomposed meat extract unto the galactophorous sinuses in cows. Next day that portion of the udder was inflamed, the milk was curdled, and puriform, containing numerous pus corpuscles and micrococci, and when injected into the udder of a healthy cow reproduced the same disease. Purulent mastitis is clearly produced in a similar way, and therefore always remains confined to single quarters of the udder. Kitt describes the disease very thoroughly, he found excessive cellular infiltration of the entire connective tissue of the udder, emigration of cells even into the lumen of the alveoli, necrosis and shedding of the epithelium of the gland, concretions in the milk ducts consisting of gland secretions.

Symptoms and Progress. The disease sets in suddenly with pain and the other symptoms of mastitis, the swelling originates in the interior of the udder, but spreads as far as the skin which is abnormally warm and reddened. Functional disturbance soon sets in, the secretion of milk diminishes or entirely disappears, the milk is curdled, and later appears yellowish from admixture of pus, or red from bleeding; finally it may become more and more puriform and contain curdled material, which blocks the milk ducts. These symptoms are supplemented by fever, loss of appetite, excessive thirst, and depression. The swelling may interfere with the movement of the corresponding hind leg and cause lameness; sometimes symptoms like paraplegia are seen.

Microscopic examination reveals numerous white and red corpuscles, pus elements, and fattily degenerated gland cells in the milk. Chemical examination shows albumen and water to be in increased quantity, sugar and casein to be diminished. Either resolution occurs or the disease goes on to abscess formation. In the first case, after four or five days, sometimes a little later, the symptoms gradually begin to recede, while the secretion more and more recovers its normal character. In some few cases no permanent disturbance is left, though as a rule the affected section of the udder does not completely recover its functional activity until the next lactation period. Abscesses, however, frequently form. Those which occur in the interstitial connective tissue either perforate into the milky canals or through the skin, they generally lie deep, and when developing in the connective tissue above the udder may lead to the destruction of a large section of the gland, as described by Johne. Permanent thickening and milk fistulæ are not infrequent results of this process. Hard swellings sometimes result from the accumulation of clots in the milk ducts, which gradually become inspissated, and form yellowish crumbling masses, surrounded by a capsule of connective tissue. They also result from abscesses, and not infrequently from the point of origin of disease at a later period.

Such suppurative processes may entail grave consequences, and at times lead to pyemia or septicemia.

Causes. There is no doubt that this form of mastitis is caused by infectious materials entering throught the mammary ducts. The experiments of Lister, Roberts, Meissner, Kitt and others show that normal milk contains no organized ferment, and therefore when such is found it must have entered from without. Further, as the diseased process always appears in a single section of the gland, the natural conclusion is that infection follows through the mammary duct. Although infection through the blood stream is possible it is unquestionably very rare. On the other hand opportunities for infection through the milk canal are very frequent. The little drop of milk left hanging in the teat after milking may facilitate it, or milk catheters or other instruments introduced into the mammary duct also act as bearers of infection. The experiments of Franck, Nocard, Mollereau and others have shown beyond doubt the possibility of this mode of infection. Numerous experiments have been made regarding the nature of the infectious material. Guillebeau found ten different microbes, comprising staphylococci, streptococci and several bacilli, possessing various degrees of virulence. Guillebeau believes that the constituents of the milk particularly the milk sugar, are decomposed by the microbes and irritant materials produced, which cause inflammation.

Prognosis. There is little hope of completely restoring functional activity to the udder during the existing period of lactation. Any further opinion may depend on the progress of the disease. When large tracts of tissue become indurated, full function will not be restored even during the next lactation, and in extreme cases life may even be endangered.

(*Continued next month.*)

The Diagnosis of Dourine by Complement-Fixation*

By JOHN R. MOHLER, ADOLPH EICHHORN AND JOHN M. BUCK
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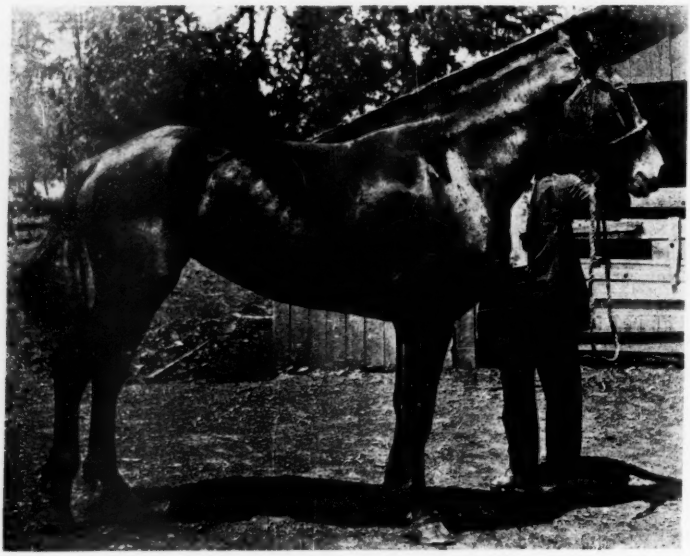
DOURINE is a specific infectious disease affecting under natural conditions only the horse and the ass, transmitted from animal to animal by the act of copulation, and due to a single-celled animal parasite or protozoan, the *Trypanosoma equiperdum.* It is characterized by an irregular incubation period, the confinement of the first symptoms to the genital tract, the chronic course which it runs, and by finally producing complete paralysis of the posterior extremities, with a fatal termination in from six months to two years.

In the United States the disease was first suspected in 1885 and recognized in 1886 by Dr. W. L. Williams, then practicing at Bloomington, Ill. The state of Illinois took hold of the outbreak, and as a result of rigid prophylactic measures the disease was eradicated from the state in 1888, but not before an affected stallion had been shipped to Gordon, Nebr., thereby starting up a new center of infection in that locality.

In 1892 dourine was again brought into public notice by the appearance of an outbreak among the breeding horses of northwestern Nebraska, the history of which suggested that it originated with this Gordon stallion. After an expenditure of about $5,500 by the Bureau of Animal Industry in fighting it the disease was considered to have been eradicated from that section of the country. Five years later the infection again made its appearance in the same portion of Nebraska, and early in 1899 the Bureau again began the work of eradication. Many inspections were made and those animals which were found diseased were purchased and killed. Many obstacles were encountered and the disease evidently kept smoldering during 1900.

*Presented at the 50th annual meeting of the A. V. M. A., New York, September, 1913.

In 1901 the infection appeared with increased vigor, this time in the Pine Ridge and Rosebud Indian Reservations in South Dakota, in addition to northern Nebraska, and more stringent measures were immediately inaugurated to control the spread of the disease. However, eradication in this region was extremely difficult, owing to the wild condition of the country as well as of the horses and from the fact that many horse owners would try to conceal from the inspectors animals which they knew to be affected with the disease. In 1906 the last suspicious cases of dourine were destroyed in South Dakota.



A BLACK MARE AFFECTED WITH DOURINE

This is a typical case of dourine, from the Iowa outbreak of 1911. Note the tucked flanks, the knuckling, thin condition and the raised plaque with a depressed center in the upper-flank region. This peculiar form of edema is said to be diagnostic of dourine when present. These plaques do not appear in all cases, and when present are ephemeral in nature, likely to be present one day and gone the next. Both this and the "whiplash" edema (which is so named because its appearance is very much like welts that may be raised by a vigorous use of the whip) are commonest over the rump and found less often on the neck and shoulders, seldom appearing on the thorax, abdomen or legs. At the time the photograph was taken this mare had one ulcer and a few small vesicles in the vagina. She was very nervous and stumbled and staggered behind when trotted. There were no depigmented areas on this animal

In the meantime during the year 1903 dourine was reported in Van Buren County, Iowa, and successful steps were immediately taken to stamp it out. No connection could be established between this outbreak and that in Nebraska, but it was quite definitely determined that an imported Percheron stallion purchased by a company of farmers was responsible for its appearance.

Another outbreak of dourine was discovered in Taylor County, Iowa, in 1911. The diseased animals, together with all exposed stallions and mares, were immediately quarantined by the State. Those showing lesions of the disease and those exposed horses that reacted to the complement-fixation test were purchased by the Government and destroyed. It is now believed that the infection is entirely eradicated from Iowa. The source from which this center of infection was derived is only a matter of conjecture, but there is apparently no connection between this and any of the previous outbreaks. No authentic information as to the origin of the outbreak was discovered, but all cases lead back to a Percheron stallion, which was imported in 1909 and brought direct to Lenox, Iowa.

Early in July, 1912, the state veterinarian

of Montana reported several cases suspected of being dourine in eastern Montana, and forwarded blood serums from each of the suspected animals for the complement-fixation test. All but one sample gave a positive reaction, thus establishing the fact that there existed a new center of infection of dourine. From present indications this outbreak appears to be more extensive of any of the previous outbreaks, involving also two Indian Reservations in North and South Dakota. A force of twelve Federal veterinarians assisted by state representatives is at work on the disease and the infection is well under control.

The difficulty of diagnosing chronic and latent forms of dourine is generally recognized, and owing to this fact the control and eradication of this disease in horses has been of slow progress and sometimes ineffective. In such outbreaks it has been the custom to trace the disease as far as possible to its origin, and then keep under observation all mares and stallions which directly or indirectly have been exposed to the disease. At the same time animals which show clinical evidences of the affection are destroyed without delay and by this means several of the outbreaks which have occurred in the United States have been checked and eradicated.

The microscopic demonstration of the Trypanosoma equiperdum in affected horses is very frequently unsuccessful, although our more recent experience proves that they may occasionally be found in the serous exudate of the plaques and also in the fluid of the oedematous swellings of the genital organs in the stallions as well as in the mares.

Of course this procedure of diagnosis can be attempted only when the disease occurs in farming localities where the animals can be readily observed and examined as desired. On the other hand, in the present outbreak in Montana and adjoining states the conditions make the diagnosis by the demonstration of trypanosomes impossible, and likewise animal inoculations can not be satisfactorily utilized for this purpose. Horses in that locality are bred under range conditions, they run wild and a roundup takes place only once a year. The difficulty of an examination even clinically of such animals is obvious since they have not been broken to the halter and are troublesome to handle.

Our experience with the disease in Montana showed that only a limited number of animals were clinically affected. Nevertheless, association of all the animals without any restriction in the breeding periods indicated that a larger number of animals would be found infected, which as a matter of fact has been proven by subsequent tests, as shown below.

Owing to the fact that until the last few years the eradication of dourine in this country was supposed to have been complete, the disease has received only slight attention as compared with other menacing diseases of our domesticated animals. It was not until the outbreak in the state of Iowa in 1911 that the necessity for devising a method of diagnosing this infection began to be fully realized. The value of being able to detect the latent as well as verify the clinical cases became apparent. Otherwise the necessity existed of maintaining a long continued quarantine in those sections of the country where cases have been discovered. While little difficulty has been experienced in recognizing the advanced cases, a clinical examination alone naturally permitted many infected animals to escape detection, only to constitute a menace to the further spread of the disease until the appearance of symptoms justified the diagnosis.

Inasmuch as the complement-fixation method of diagnosis has been employed with such gratifying results in connection with numerous other diseases, the possibility of applying this method to dourine naturally suggested itself and steps were therefore immediately taken to determine the feasibility of its application to this disease.

It was very early discovered that the problem of preparing a satisfactory antigen was to offer considerable difficulty.

Efforts were primarily directed toward utilizing for this purpose the different organs of those horses that had succumbed to the disease. Several of the clinical cases were shipped from Iowa to the

Bethesda Experiment Station during the outbreak referred to above in order that a more complete observation might be made of the development of the disease, and material might at the same time be available for antigen preparation.

As these animals died from time to time, certain tissues were obtained which it was thought might furnish the desired results, but although shake extracts of the spleens, livers, kidneys and bone marrow, as well as alcoholic and acetone preparations were employed under various conditions, the results were rather of a discouraging nature.

Subsequent to this time there came under our observation publications by numerous investigators who had given this subject consideration. It will suffice to mention the publications of Landsteiner, Müller und Pötzl, Levaditi und Yamanouchi, Hartoch und Yakimoff, Schilling, Claus und Hösslin, Citron, Weber, Manteufel, Manteufel und Woithe, Zwick und Fischer. The results in these instances appeared to have been unsatisfactory, which was also the case in the extensive work on the diagnosis of dourine by the Wassermann method by Trajan Pavlosevici, as he concluded that while antibodies can be demonstrated by this method in laboratory animals infected with trypanosomes, the method can not be utilized in stallions affected with dourine.

Later Winkler and Wyschelessky, Mohler and also Watson in their work on complement-fixation as an aid in the recognition of trypanosomiasis indicated the good results obtained in the diagnosis of dourine. Likewise, Mattes, in his work on the agglutination of trypanosomes, obtained gratifying results, while Brown also concludes that complement-fixation can be utilized for the diagnosis of trypanosome affections.

In the recorded publications it was observed that the more promising results were obtained by those who employed suspensions of pure trypanosomes. The organ extracts and other preparations of antigens generally used for this purpose proved unreliable. The procedure as recommended by various workers in obtaining an antigen from pure trypanosomes and using such a suspension as the antigen has also been tried by the writers with uniformly good results. The practical application of this procedure, however, would be very laborious and require a great deal of time, especially in cases where a large number of horses have to be tested by this method. Accordingly, it was deemed advisable to devise a means by which an antigen could be prepared which would give similarly good results but would not require such delicate and laborious technic. In place of the specific trypanosome of dourine being utilized, the writers selected the surra organism as it had been previously ascertained by several investigators that the reaction obtained was not absolutely specific for any one trypanosome infection, but was rather of a group nature.

As dourine is the only known trypanosome affection of horses existing in this country, the value of even a group reaction was immediately appreciated and attention was directed to the carrying out of this idea in our diagnostic work.

In place of preparing suspensions of the trypanosomes, however, an antigen was made of the blood and macerated spleens of rats killed at the height of surra infection. This was placed in a bottle containing glass beads and shaken for six hours filtered through gauze and carbolized. The results from this antigen proved satisfactory and was used repeatedly on the blood of the dourine horses that were left of the Iowa shipment.

The smallest quantity of the serum which gave a positive reaction with the antigen was .05 Cc., while the various comparative tests indicated that even a fixation in .2 Cc. of serum is sufficient for diagnostic purposes.

Sera from normal animals, also those affected with various other diseases failed to give a reaction.

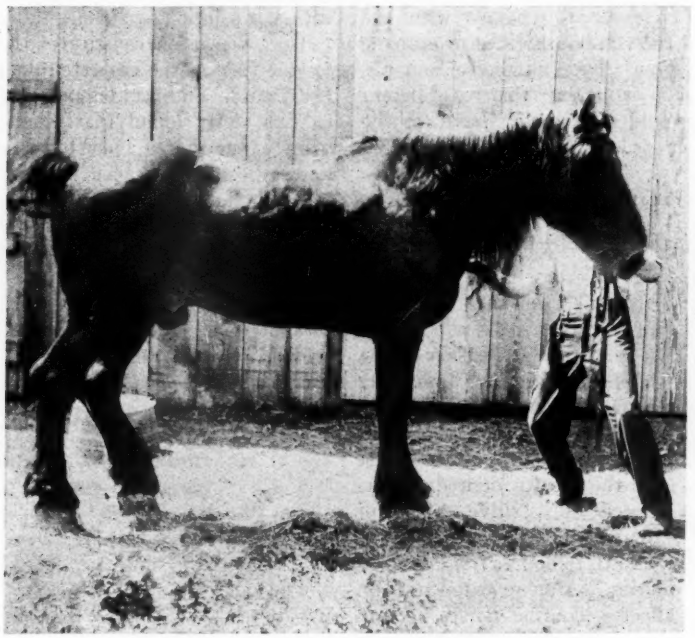
This antigen proved active on ten consecutive days, but failed to produce fixation of complement on subsequent tests.

Later attempts by the same procedure also resulted less satisfactorily and it was therefore deemed advisable to try other

methods in order to procure an antigen of more uniform action.

The following procedure was next employed:

After successive examinations of the blood of a dog infected with surra, about 200 Cc. were drawn from the jugular vein when the microscopic examination revealed a tremendous infestation with the parasite. The blood was drawn into a one percent



SULTAN, A STABLE MATE OF GAYLORD, WHO DIED OF *Maladie du Coit*

This illustration [from a case in the Iowa outbreak of 1911] shows typical symptoms of dourine. The testicles and the sheath enlarged and pendent; weakness in the hind legs, breaking over at the fetlocks and resting on the toes of the hind feet. It also shows the "whiplash" edema that was to be seen in about one-half the cases in this particular outbreak. This animal was tucked in the flanks, and losing in condition rapidly at the time the photograph was taken. In the Iowa outbreak the depigmented areas given in textbooks as a constant and prominent symptom of dourine were not present except in a few cases, and in these they were insignificant in size and number and quite evanescent in character.

potassium citrate solution into large centrifuge tubes of 100 Cc. capacity. A quantity of potassium citrate solution was used equal to the amount of blood drawn into each tube, and 0.5 Gram of saponin was added to each tube in order to dissolve the red blood corpuscles. After a thorough shaking and complete hemolysis had taken place, it was centrifuged for 30 minutes at 2,500 evolutions, and the supernatant fluid was siphoned off. The residue which was of an opaque color and which consisted principally of trypanosomes was then thoroughly mixed and shaken up with salt solution when it was again placed in the centrifuge; this washing was repeated three times. After the last washing the thrown-down opaque mass was emulsified with 50 Cc. salt solution and titered as to its merits as an antigen for dourine tests. The results were highly satisfactory and the titer was established at 1-2 Cc. of this emulsion per tube. The disadvantage was soon apparent on account of the difficulty in the preparation of this antigen and also the small quantity which was obtainable from a single bleeding of a dog.

In July, 1912, the above-mentioned outbreak of dourine was discovered in the State of Montana.

Several samples of blood sera from clinical cases were forwarded by the state

authorities to the Pathological laboratory for verification. Positive reactions were obtained in numerous instances with antigens thus prepared, establishing conclusively the presence of the disease in this state as well as suggesting the possibilities of the test as a means of its eradication.

It was not long before discovery was made that the disease was quite widely spread in Montana owing to the previous failure to recognize it.

In an endeavor to comply with the request of the state authorities to examine the blood from a large number of animals, it was soon apparent that a different method would necessarily have to be devised in order to make the desired progress.

It was at this time that our present method of preparing antigen was first employed, which is as follows:

Various organs from rats just dead from surra were tried out in a fresh and preserved state and the results which were obtained from the fresh suspension of the macerated spleen of a rat just dead from surra gave the most promising results. In order to establish whether such an antigen would constantly or at least in most instances give the results desired it was repeatedly tested on positive serum of horses affected with dourine as well as on horse serum known to be free from immune bodies of dourine. After repeated tests on clinically affected dourine horses showed the antigen to be uniformly constant in its action, the procedure of diagnosing dourine by this method was definitely adopted.

Preparation of Antigen

Gray or white rats are infected with surra by injection of 0.2 Cc. of blood from a rabbit infected with surra. Since tests have to be made every day to keep up with the large number of cases submitted and as the antigen proves effective only when prepared fresh, it was arranged that at least two rats should die daily with the disease. When the rats appeared to be at the point of death late in the afternoon, it was found that placing such rats in the ice chest until they die furnished a better antigen than when they have died in the cage during the night and have to be used the following morning.

The spleen from the rats is removed, placed in a mortar, and ground up with a small amount of salt solution to a pulpy mass. From time to time more of the salt solution is added and the suspension thus obtained is filtered twice through a double layer of gauze into a test tube. The quantity of the suspension from each spleen is made up to 40 Cc. by dilution with salt solution.

This suspension constitutes the antigen for the tests of the suspected dourine sera. Dr. Traum, who was temporarily assigned to this work, found that when the suspension was titered against the serum of a known positive and a known negative case in graduated quantities, the best results were obtained and this method has since been adopted. The quantity of antigen employed is double the amount necessary to produce complete fixation with positive serum. The following table gives the method of titration of the antigen as practiced.

TABLE SHOWING METHOD OF TITRATION OF ANTIGEN FOR THE COMPLEMENT-FIXATION TEST IN DOURINE

POSITIVE SERUM

Tube	1 Na Cl Solution	Serum	2 Antigen	3 Complement		4 Hemolytic Serum	5 Blood Corpuscles	
	Cc.	Cc.	Cc.	Cc.	For one hour in incubator.	Cc.	Cc.	For one hour in incubator.
1	2	0.15	0.05	1		1	1	
2	2	0.15	0.1	1		1	1	
3	2	0.15	0.15	1		1	1	
4	2	0.15	0.2	1		1	1	
5	2	0.15	0.25	1		1	1	
6	2	0.15	0.3	1		1	1	
Negative Serum								
1	2	0.15	0.1	1		1	1	
2	2	0.15	0.2	1		1	1	
3	2	0.15	0.3	1		1	1	
4	2	0.15	0.4	1		1	1	
5	2	0.15	0.5	1		1	1	
6	2	0.15	0.6	1		1	1	

1. 0.85 percent Na Cl solution.
2. Suspension of macerated spleen from rat.
3. The determined smallest quantity established by titration.
4. Sensitized rabbit serum.
5. Five percent suspension of sheep, red blood corpuscles.

Half the quantity of antigen which in the negative serum does not inhibit hemolysis, providing this quantity is at least double the amount necessary to produce complete fixation with the positive serum, indicates the titer of the antigen. Thus, for instance,

if tubes with negative serum 1, 2, 3 and 4 show complete hemolysis and 5 and 6 slight inhibition, and at the same time tubes with positive serum 6, 5, 4, 3 and 2 show complete fixation and 1 partial fixation, the quantity of antigen for the test proper would be 0.2 Cc. of the antigen.

Occasionally the antigen does not prove satisfactory for the test and has to be discarded. In these cases the fixation in all tubes is apparently due to the excessive amount of proteids from the spleen. Experience has shown that the excessively large spleens contribute such an antigen. This, of course, is indicated by the titration undertaken prior to the regular test. At other times it was found that the antigen proved satisfactory the following day when it was allowed to stand in the test tube over night and the supernatant fluid drawn off for the antigen. This is then retitered and the titer established in accordance with the results of the test.

The Complement-Fixation Test

The test proper for the diagnosis of dourine is carried out in a similar manner

(*Continued on page 590.*)

Blood Diseases of Birds

By B. F. KAUPP, M. S., D. V. S., Spartansburg, S. C.

UNDER blood diseases come the septicemias as apoplectiform septicemia, sephcemia of geese, typhoid of fowls, and spirochetosis, all caused by germs which live and multiply in the blood stream.

Apoplectiform Septicemia in Chickens and Pigeons

This disease is due to the streptococcus gallinarum, which grows in long or short chains. It can be readily grown upon artificial media and does not liquefy gelatin. Experimental inoculations with this organism killed the following animals: chickens, mice, rabbits and swine. It does not kill guinea pigs or dogs. The germ multiplies in the blood.

Symptoms.—Apoplectiform septicemia is rapid in its progress. Often birds die in from twelve to twenty-four hours after the first symptoms appear. Birds in which no symptoms of the disease had been noticed may be found dead under the roosts. The bird shows great prostration, feathers ruffled, loss of appetite, and the condition rapidly terminates in death. This disease often causes great loss to pigeon fanciers.

Postmortem Findings.—The spleen is enlarged, dark and soft, Focal necrosis is noted in the kidneys, spleen and liver. Cloudy swelling is also noted preceding this state. Pneumonia may be present. The germs can be isolated in pure culture from any of the organs named.

Treatment.—Sanitation as directed for chicken cholera (May issue VETERINARY MEDICINE, page 262). If possible separate the well birds from the sick. Vaccination with a vaccine made from the streptococcus gallinarum has given good results. Sulphocarbolates compound may be tried as outlined in the article on chicken cholera referred to above.

Septicemia of Geese

This disease has been described as being caused by a germ which closely resembles the polar staining germ of chicken cholera. It multiplies in the blood.

Symptoms.—Geese are often found dead without having been noted to have been ill. The majority die very quickly, that is within two or three hours after first symptoms appear. Occasionally one bird may live for several days but finally dies.

Postmortem Findings.—Small pinpoint hemorrhages may be noted, especially in the mucous lining of the intestines. Usually the digestive tract contains feed in all stages of digestion, indicating that the disease is very rapid in its onset. Considerable mucus may be found in the mouth and throat. Inflammation may be noted in the liver, pericardium (heart sac), spleen and kidneys.

Treatment.—Sanitary measures the same as those given for chicken cholera.

Fowl Typhoid. Infectious Leukemia

This is due to a short, plump germ with rounded ends. It is called the Bacterium sanguinarium, and is easily isolated from birds dead of the disease. It reproduces the disease in inoculated birds, multiplying in the blood.

Symptoms.—Anemic or blanched appearance of the mucous membranes of the head with a dull appearance and great prostration, usually ending in death in about four days, is characteristic of this disease. In some cases the affected bird may live three to four weeks. Moore reports a decrease in red blood cells and an increase in white blood cells, the latter principally the polymorphia.

Postmortem Findings.—The liver is enlarged and mottled with grayish patches due to areas of leukocytic invasion. The germ can be isolated from the internal organs. The kidneys show congestion which is recognized by the minute red lines. The intestines may be congested. The spleen usually appears normal in size and color. The red blood cells gradually diminish and a leukocytosis (an increase of the white blood cells) appears.

Fig. 37—Blastomycosis of a Pigeon. A. The Necrosing Mass in Which May Be Found Yeast-like Bodies

Treatment.—Prompt isolation of the well from the sick birds and sanitary measures as given for fowl cholera.

Spirochetosis

This is a blood disease (septicemia) due to a spiral-like microscopic germ which is supposed to be carried from bird to bird by means of the chicken tick. Fig. 40 shows a drawing of the germ. It is the spirocheta gallinarum. The slide from which this drawing was made was kindly sent to the author by Dr. Balfour of Khartoum, Sudan, Africa.

In the sick animal is noted a dullness, loss of appetite, rapid emaciation, head and tail down, and standing around, in corners or on the roost, with eyes closed. Fig. 41 shows a photograph of a typical case. Note the attitude of head, tail and body.

This disease was first recognized in Brazil, it is found in Africa and Europe; and a disease occurring in the southern part of the United States, where the chicken tick is abundant, has symptoms similar to those described above. So far as the author knows no definite work has been done to determine the true cause of this southern chicken disease.

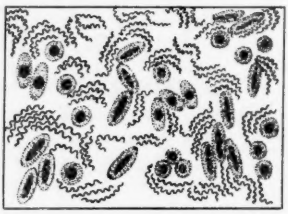


Fig. 40—Drawing of Spirocheta Gallinarum Made from a Blood Smear; Showing Thrombocytes, Leukocytes-Red Blood Cells and Myriads of Corkscrew-like Spirochetes

The disease is most common among chickens, but also infects geese, ducks, pigeons and sparrows.

Another form of septicemia in chickens is caused by a comma-shaped germ, the Spirillum Metchinikovi or Vibrio Metchinikovi.

The symptoms are similar to those of fowl cholera, except that there is no, or at most, but slight elevation of the temperature. Diarrhea is constantly present. Inflammation of the bowel and enlarged liver (hepatitis) is noted. The disease has not been reported in this country.

Thrombosis

A bird was sent to the laboratory with the history that it had been sick for several

weeks. There was a partial loss of appetite, finally complete loss; the bird showed weakness and a gradual emaciation. The hen died in about two weeks after coming to the laboratory.

At autopsy there was noted great emaciation. All organs appeared normal except the circulatory system. There was thrombosis (complete plugging) of the right brachial artery (artery to right wing) and the same of the large vessel to the liver as well as of the iliac and femoral artery of the left side (artery to left leg). Upon microscopic examination they were found to be white thrombi.

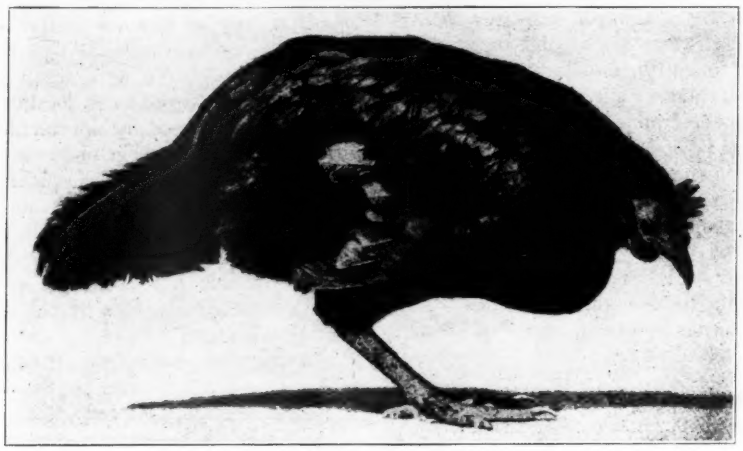


Fig. 41—Photograph of Hen Suffering from Acute Spirochetosis—after Balfour

Blastomycosis of the Pigeon

There is a condition in pigeons in which there is a nodular mass in the upper portion of the esophagus, due to a kind of yeast like germ. It is termed blastomycosis, and is well illustrated in Fig. 37. The squabs become affected early, and as the diseased or tumor-like area becomes larger, the bird is unable to eat or swallow. The loss in some breeding establishments is considerable. The disease-area manifests itself as a lump in the throat or neck which is easily felt.

Treatment.—It will be necessary to keep the premises thoroughly clean, constantly disinfected, washed with an antiseptic. The trays after each batch of squabs need to be cleaned and disinfected, as in fact does the entire building.

Some good results have been obtained by treating these squabs early with a solution of sulphocarbolates compound. Also other antiseptics recommended for chicken cholera. In squabs it will be necessary to use a medicine dropper and inject the solution into the mouth, several times a day. If the disease has progressed very far, it is best to kill the squab and cremate it.

Coccidiosis in Wild Ducks

Two wild ducks (mallards) were sent to the laboratory by the game warden of Colorado during the fall of 1910, with the history that they had been found dead on a reservoir, and that the wild ducks were dying in large numbers. A careful autopsy was held on these. There were small pearl-like nodules throughout the lung of one of the ducks. Both showed ulcerations of the mucous membrane of the intestinal tract. These ulcerations were numerous, as many as eight or ten in each bird, and extended the entire length of the intestines. Upon microscopic examination of these lesions as well as of the lung nodules coccidia were noted which resembled the *Coccidium tenellum*.

The Diagnosis of Dourine by Complement-Fixation

(*Continued from page 587.*)

to that practiced for the diagnosis of glanders.[1]

The hemolytic system consists of sensitized rabbit serum, serum from a guinea pig and a five percent suspension of washed sheep corpuscles.

The serum to be tested is of course inactivated for one-half hour at 56° C. and is used in the tests in quantities of 0.15 Cc., since it has been found that fixation in this quantity is obtained only with sera of horses affected with dourine. Tests to determine the smallest quantity of serum of dourine horses which will give a fixation showed that in several instances even 0.02 Cc. of serum was sufficient to give a complete fixation. The complement from the guinea pig is always titered previous to the test as it is absolutely necessary to use the exact amount of complement to obtain the best results, since a deficiency or an excess of complement would interfere greatly with the reaction. In the numerous cases which have been tested the results were almost invariably definite, and only on a very few occasions was it found necessary to make retests on cases which appeared atypical. The reaction is always very marked and in our work only a complement-fixation with the quantity of serum mentioned is recognized as a positive reaction. It is only natural that in the tests the usual number of checks should be employed in order to insure reliable results.

Since the testing has been undertaken by the described method, 8,657 samples have been examined from Montana, and the Cheyenne and Standing Rock Indian Reservations in North and South Dakota. Of these, 1,076 gave positive reactions, which appears to be a very large proportion, but when it is remembered that these animals were kept under range conditions without sanitary or veterinary control and also that before the disease was recognized as dourine, it had been diagnosed for a long period as some other affection, it will be recognized that the opportunity for the spread of the disease was ideal.

With the present system of diagnosis, by which even the latent cases can be determined, it is hoped quickly to eradicate the disease. All the horses in the infected localities will be submitted to the complement-fixation test, and by cooperation with the state authorities means will be devised to dispose of the affected animals in such a way as to make further spread of the disease impossible. The animals which were destroyed as a result of the disease in the above-named localities and which were diagnosed by the complement-fixation test, showed in most instances some lesions indicative of the disease. In some of the cases there were no indications of a progressive paralysis, but the lesions existing in the genital organs of either the male or female were sufficient for confirmation of the diagnosis by the complement-fixation test.

It is, therefore, evident that the diagnosis of trypanosome infections by the complement-fixation test is of very great importance, especially in countries where only one of these protozoan diseases exists. By this means it is possible to determine all infected animals within a short time, and dispose of them by methods best suited for the control of the infection. Furthermore, the introduction of the disease into any country could also be guarded against by a compulsory requirement of this test on all horses imported from countries in which dourine is present.

1. A more detailed description of the technique of this method as applied to glanders will be found in Bulletin 136 of the Bureau of Animal Industry, by Mohler and Eichhorn, under "The Diagnosis of Glanders by the Complement-Fixation."

Bibliography

BRAUN, H. Uber das Verhalten der Trypanosomen Antikörpern Gegenüber. Centralblatt für Bakteriologie, etc., Abteilung I, Referate, Band 54, Beilage, p. 11-16. Jena, 1912.

CITRON, JULIUS. Die Komplementbindungsversuche bei Erkrankungen mit Bekanntan, aber inicht Züchtbaren Erregern. Kraus, Rudolf and Levaditi, C.: Handbuch der Technik und Methodik der Immunitätsforschung, Band II, p. 1112. Jena, 1909

HARTOCH, O. and YAKIMOFF, W. Zur Frage der Komplementbindung bei Experimentellen Trypanosomen. *Wiener Klinische Wochenschrift*, Jahrgang 21, No. 21, p. 753-755. Wien, May 21, 1908.

LANDSTEINER, K.; MÜLLER, R., and PÖTZL, O. Uber Komplementbindungs-reaktionen mit dem Serum von Dourinetieren. *Wiener Klinische Wochenschrift*, Jahrgang 20, No. 46, p. 1421-1422. Wien, Nov. 14, 1907.

———. Zur Frage der Komplementbindungsreaktionen bei Syphilis. *Weiner Klinische Wochenschrift*, Jahrgang 20, No. 50, p. 1565-1567. Wien, Dec. 12, 1907.

(*Continued on page 623.*)

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Opportunities for Veterinarians Having A Knowledge of Spanish

THE Secretary of Agriculture has published rules and regulations governing the importation of meat and meat food products to carry out the meat section of the tariff act approved on October 3.

The regulations provide for foreign certifications as to antemortem and postmortem inspection in countries which the animals are slaughtered. In addition, meats will be inspected by the Department of Agriculture at ports of entry before admission. Attached to the regulations is a full list of veterinary inspectors in foreign countries whose certificates are acceptable to the United States.

The regulations also place foreign meats after entry into the United States on the same basis as domestic meats. Heretofore imported meats have been governed entirely by the food and drugs act and have been excluded from the establishments under the inspection of the Bureau of Animal Industry under the meat-inspection act. Under the new regulations imported meats are placed under the meat-inspection act after entry and thus are admitted to Federally inspected establishments and are governed by the same inspection system as heretofore has surrounded interstate commerce in domestic meats. The general rule is that no meats that are diseased, contain harmful dyes, chemicals, preservatives, or other ingredients which render such meat or meat product unsound, unhealthful, unwholesome, or unfit for human food will be admitted.

All evidence indicates a rapid development of the livestock industry in Latin-America. There is little question but that the Spanish-speaking countries to the south of us will in the near future be an important source of meat supply, not only to the United States, but to the world. Latin-America realizes this and they are now taking the preliminary but necessary step to entering the world's markets by establishing a thorough, modern, meat inspection service.

There are a score or more American veterinarians now at work in Spanish-speaking countries, and the future possibilities are splendid fields for veterinarians, who are trained in American meat inspection methods and are familiar with the Spanish language.

There is no foreign language that is of

greater *practical* value to the American than Spanish, for our foreign relations with Spanish-speaking people will doubtless be much more intimate in the future than in the past.

Spanish is a beautiful language and the ability to speak it is comparatively easy to acquire. Every young veterinarian should learn it if possible, and fit himself for this new and promising field of service; the time may come when it will be to his advantage to be so equipped.

NEW ORLEANS THE NEXT CONVENTION CITY FOR THE A. V. M. A.

As forecasted last month, in our report of the New York meeting of the A. V. M. A., New Orleans has been selected as the place for holding the 1914 meeting, and the date set, as predicted, for December 28, 29, 30 and 31.

MELVIN TO STAY IN U. S.

While Dr. A. D. Melvin, chief of the Bureau of Animal Industry, was on the ocean enroute from his tour of inspection in South America it was widely reported through the Associated Press and copied by the agricultural publications that he had accepted a position in Argentina, analogous to that of chief of the B. A. I. in this country.

As it is well known that Argentina hopes to build up an important trade in the importation of meat to this country, and as to do this it must satisfy the Bureau of Animal Industry that its meat products have received an inspection at the time of slaughter equal to our Federal meat inspection, and as no one is better qualified to organize and conduct such an inspection for Argentina than Doctor Melvin, the report gained credence. It was, however, wholly without foundation, as the following letter from Doctor Melvin shows:

"Upon returning from South America last week I learned with great surprise that a report had gained quite general circulation to the effect that I had accepted a position in Argentina at a high salary and was to go there in the near future. As this rumor was absolutely without any foundation in fact, and as many veterinarians are inquiring regarding the matter, I hope you will deny the story through the JOURNAL. It is not my purpose nor wish to leave the United States, as I look upon it as the best country in the world.

"As a matter of interest, I might mention here that there is not much room in South America for veterinary practitioners. Those who are there now for the most part are residents of the respective countries and occupy positions with their governments.

"I had a very pleasant journey, and an instructive one, and I am glad I had the opportunity of making the trip. I met a number of very high-class veterinarians who, as stated above, are occupying government positions."

AGRICULTURAL AND OTHER BULLETINS OF INTEREST TO VETERINARIANS

MEDICAL MILK COMMISSIONS AND CERTIFIED MILK, by Ernest Kelley. This is bulletin No. 1 of the new series of the Department of Agriculture. It deals at length with the subject of certified milk, giving the history of the growth of certified dairies, method of organization of medical milk commissions, the method of producing certified milk and its cost, and a complete set of regulations and standards for the control of certified milk and the dairies producing it. The bulletin contains thirty-eight pages and is well illustrated. It is of course indispensable to veterinarians having to do with milk inspection, or in any way interested in clean milk or its production and distribution.

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EYE WORM OF CHICKENS, by E. V. Wilcox and C. K. McClelland, Bulletin No. 43, the Hawaii Agricultural Experiment Station, Honolulu. This bulletin deals comprehensively with the subject mentioned in its title.

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THE LIFE-HISTORY OF THE SHEEP-TICK, by Leroy D. Swingle, Bulletin No. 99,

(*Continued on page 628.*)

WORLDS WORK in Veterinary Science

A digest of all the Current Literature of Comparative Medicine

By Dr L. W Fetzer Washington D.C.

TREATMENT of sunstroke in horses with physiological salt solution. District Vet. (Schad. Münch. Tierärztl. Wochenschr. Vol. 56, No. 50).—Various horses were treated by giving subcutaneous injections of physiological salt solution. The treatment is based on Hirth hypothesis who believes that sunstroke is due to a loss of salts from the body where sweating is produced by drinking an excess of water.

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THE EXPERIMENTAL production of pernicious anemia in rabbits, H. M. Adler (Jour. Med. Research, 1913, Vol. 28, No. 1, pp. 199-226).—Fat in the form of olive oil or cotton-seed oil is toxic to rabitts, if fed in sufficiently large quantities. The toxiccity of cotton-seed or olive oil depends upon its content of unsaturated fatty acid. The more unsaturated the fats fed, the greater the toxic effect. Long continued daily feeding of non-toxic doses of oil produces blood crises resembling pernicious anemia. Long continued feeding of oil produces extreme emaciation. Long continued feeding with nontoxic doses of quinine protects rabbits against the effects of fat intoxication. This protective action of quinine is probably due to an effect upon the lymphoid tissue. The anemia thus produced is probably due to a destruction of red cells in the blood vessels of the abdominal organs rather than to a direct effect upon the bone marrow. This effect, being at the periphery in respect to the blood-forming organs, acts as stimulant to the bone marrow and, as a result, high red blood counts are encountered. The hemolytic substance being a fat is not capable of true solution in the body fluid. It is therefore present in the body in the form of more or less finely divided colloidal particles.

The hemolytic effect is not a uniformly diffused one, but is dependent upon the meeting of a particle of hemolytic fat with a red cell. The degree of injury to the individual cell depends upon the size and number of particles acting upon it. The anemia is, therefore, not one uniformly affecting the red blood cells. The red cells show all possible variations from well-colored and normally formed individuals to extreme achromia, etc. The manifestations of the toxicity of fat is due to the summation of individual reactions between body cells and effective particles.

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A NOTE on the maintenance of virulence by Bacillus abortus, Bang, F. M. Surface Jour. Infect. Diseases (1913), Vol. 12, No. 3, pp. 359-363.—The subcutaneous injection of a cow with 20 Cc. of a dilute mixture of three Danish strains of B. abortus which had been grown in the laboratory for more than two years, produced a typical abortion fifty-two days after the injection. The mixture had not been heated but contained one-half of one percent of carbolic acid. The cultural test made at the time revealed no growth from this mixture. Since that time it has been found that one-half of one percent of carbolic acid is not sufficient to kill this organism.

Cultures of this organism were isolated from the afterbirth and fetus. These cultures grew readily in the air. Growth appeared on plain agar on the second day of incubation. In these respects they agreed with the Danish strains injected

and were totally different from the strain of this organism prevalent in the Experiment Station herd.

Blood tests at various intervals showed the appearance of antibodies fourteen days after inoculation or about five weeks before the abortion. Thus after more than two years' growth under laboratory conditions this organism has retained its original virulence.

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INOVATION in the therapy of contagious vaginal catarrh in bovines. Dr. Boernec. Berlin. Tierärztl. Wochenschr. 1913, Vol. 29, No. 21, pp. 380-381.—The treatment consists in giving salts of iodine (kind not stated), bacillol, formaldehyde in glycerin as a vehicle. The remedy is injected into the vaginal orifice with an ordinary 10 Cc. syringe.

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IN REGARD to vaccinating against the pectoral form of equine influenza. D. Konew. Berl. Tierärtzl. Wochenschr. 1913, Vol. 29, No. 33, pp. 589-591.—Successful results were obtained by vaccinating horses not yet affected with the disease with 1 to 2 Cc. of the virulent blood of horses affected with the pectoral form of equine influenza (contagious pleuropneumonia). The apparently healthy horses were in barns with horses having the disease.

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THE receptivity of hogs for blackleg. S. Von Ratz. Zeitschr. fv. Infektskr. u. Hyg. d. Haustiere, 1913, Vol. 14, No. 1, pp. 1-8.—In the experiments nine animals were treated with material coming from bovines affected with blackleg. All of the hogs took the disease and in seven animals a small or large swelling was noted at the site of injection and which gave evidences of crepitation. Six of the animals gave a very marked local reaction and showed marked constitutional disturbances such as lassitude, loss of appetite, an increase in temperature, etc. Three of the animals died.

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SOME further investigations in regard to (open) liver tuberculosis in the bovine and pig. E. Joest and M. Zeigler. Zeitschr. fv. Infektskr. u. Hyg. d. Haustiere. 1913, Vol. 14, No. 1, pp. 9-40.—The primary cause for the presence of tubercle bacilli in the bile of bovine and pigs is probably the presence of tuberculous foci in the liver. The blood stream plays only a minor part. The dissemination of the disease when liver tuberculosis is present is discussed.

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INVESTIGATIONS in regard to Coital exanthema. Drs. Zwick and Gruinder, Berlin, Tierärztl. Wochenschr. 1913, Vol. 29, No. 36, pp. 637-640.—The causative agent of vesicular or coital exanthema is not a filterable virus. The period of incubation of this condition, i. e., the causative factor, as determined with young bovines, was found to be around 18-36-50 hours.

The virus when kept outside of the animal body at a low temperature is virulent for many weeks (and at times for months). In the animal body, however, the virus soon loses its infectiousness, and its capacity to infect is considered extinct when the various signs of inflammation have disappeared and the mucous membranes of the external genital organs have regained their normal appearance.

One attack of the disease does not protect against a second. In addition to the horse, the goat and sheep can take the disease. No relation seems to exist between coital exanthema and cow pox.

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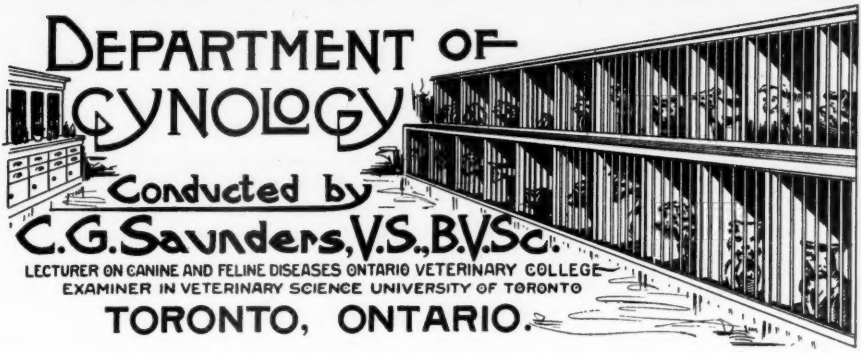
ABOUT oryzanin, a new constituent of rice bran, and its physiological significance, U. Suzuki, T. Shimamura, and S. Odake Biochem. Ztschr., 1912, Vol. 43, Nos. 1-2, pp. 89-153.—Chickens, pigeons, mice, and a few other animals when fed exclusively on field rice, became sick and showed a progressive loss in weight. This is due to a substance peculiar to the bran, which the authors have succeeded in extracting, and have termed it "oryzanin." They found that a feeding stuff lacking in this substance could not prolong the life of the animals under treatment. Dogs, for instance, could not thrive on boiled (extracted) meat and rice. Dogs which were emaciated by such feeding were restored to their normal weight by feeding 0.3 Gm. of an alcoholic extract of rice hulls, i. e., oryzanin.



Diseases of the Digestive System

(Continued from last month)

Pharyngitis or Sore Throat

Cause.—Pharyngitis or inflammation of the mucous membrane of the pharynx may be caused by extension or the spread of inflammation from contiguous organs; by irritant medicines and chemicals, foreign bodies or by injuries caused by unskillful attempts at removing obstructions lodged in the throat or in passing the probang.

Symptoms.—Pharyngitis is manifested by a somewhat stiff carriage of the head; difficulty in swallowing solids; sometimes by coughing, especially if laryngitis exists also, and by a congested appearance of the affected mucous membrane.

Treatment.—The throat must be examined for foreign bodies and if any are found they must be removed; this often presents considerable difficulty in the case of needles or pins and great care must be exercised to avoid breaking them. The throat should then be sprayed either with iodine solution, hydrogen peroxide or Dobell's solution of the following formula:

Borax	grs.	130
Sodium bicarbonate	grs.	130
Carbolic acid	grs.	25
Glycerin	fl. ozs.	5½
Water, q. s.	fl. ozs.	20

The diet must be restricted to liquids and soft foods to avoid irritation of the inflamed mucous membrane.

Parotitis: Inflammation of the Parotid Gland (Mumps)

Cause.—There are four varieties of parotitis (or parotiditis), the causes of which differ. They may be classed as follows:

Contagious parotitis, the specific organism of which has not yet been determined.

Traumatic parotitis, produced by injuries.

Metastatic parotitis, due to a metastasis of pyogenic organisms during attacks of distemper, pyemia, or septicemia.

Parotitis caused by the extension of a neighboring inflammatory focus, as in pharyngitis, mastoiditis, etc.

Symptoms.—In the contagious form the whole gland or both glands are swollen and tender, but there is no tendency to suppuration. In the other varieties the swelling is more circumscribed and suppuration usually takes place. The swollen glands are hot and tender and the act of swallowing is difficult and painful. Constitutional symptoms are fever, anorexia and lassitude. In suppurative cases fluctuation detected and the fever is usually high.

Treatment.—The patient should receive a mild laxative, olive oil or cascara and the affected glands after being freely fomented with hot water, should receive an inunction of warm camphorated oil, or have kala-plasma kaolina applied to them.

Moist heat in the form of Preistnitz compresses often give great relief by lessening the tension of the parts and in cases where abscess formation is taking place, hastens the formation of the pus. Abscesses should

be evacuated, drainage established and the wound treated antiseptically. The diet must be of a liquid nature; such as beef-tea, milk and soft mushes.

Foreign Bodies in the Esophagus and Choking

Choking is caused by the lodgment in the throat or esophagus of some foreign body and is usually the result of greediness in feeding. The most common foreign bodies are bones, gristle, needles and pieces of wood.

Symptoms.—The patient is greatly distressed, efforts at deglutition are greatly increased, and there is a return of food and drink through the nostrils.

Treatment.—Sometimes the offending article may be forced back into the mouth by manipulation of the exterior parts and in some cases extraction is easy with throat forceps; but in cases where neither of these methods are successful the probang must be passed and the offending body cautiously pushed on to the stomach. In the case of fish bones or needles the operator may be able to entangle them in the horse-hair portion of the probang and extract them.

Great caution must be exercised not to use undue force or the esophagus may be ruptured with serious if not fatal results. Fuller directions for passing the probang and for esophagotomy will be given in a future article.

Diseases of the Stomach and Intestines

In the dog impaction of the stomach and gastritis constitute about sixty percent of all diseases of digestion. This is mainly due to the want of proper attention to the animal's diet and to the practice of feeding only once a day, whereby the animal seeks to satisfy its hunger in a voracious manner.

Impaction of the Stomach

Cause.—Over-feeding, and improper food.

Symptoms—Vomiting, which if it takes place may empty the stomach and so relieve the condition, but in the majority of cases vomition is not violent enough to give much relief and the patient will retch, slaver and eructate gas. Pressure over the epigastric region produces pain, the respirations are accelerated and the patient is greatly depressed. There are colicky symptoms with great uneasiness and a frequent desire to change positions. The animal groans or whines and may be irritable and "snappy."

Treatment.—Empty the stomach by a hypodermic injection of apomorphine, gr. 1-20 to 1-10. Enormous masses of undigested or partially digested food are usually vomited and relief is almost instantaneous. The stomach may then be washed out with the stomach pump, or eight to ten ounces of water may be administered and the dose of apomorphine repeated to again empty the stomach. A gastric sedative such as bismuth subnitrate, grs. 5 to 20 may then be administered and the animal's diet restricted for a week or longer to small quantities of easily digested food.

Gastritis: Inflammation of the Mucous Membrane of the Stomach

This ailment occurs both in the acute and the chronic forms.

ACUTE GASTRITIS:

Cause.—Acute gastritis is caused by irritating foods or medicines such as decomposing meat or arsenic, corrosive sublimate, phosphorus, etc., as well as by foreign bodies. Acute gastritis also occurs as a symptom of distemper.

Symptoms.—There is vomiting, with little or no appetite; increased thirst, great quantities of water are sometimes taken only to be immediately vomited again. There is more or less constipation. The temperature is raised and the pulse accelerated. Pressure on the stomach causes pain. The patient is greatly depressed, lying down a great deal and assuming an almost diagnostic attitude, by trying to rest its abdomen on the floor.

Treatment.—If an irritant-poison, decayed meat or a foreign body, is suspected to be the cause, an emetic should be ad-

ministered to clean out the stomach. The vomiting may be controlled with bismuth subnitrate, grs. 5 to 20, combined with cerium oxalate, grs. 3 or chloretone, grs. 5. The constipation may be overcome by laxatives and enemas. If the pain indicates it, morphine in 1-4-grain doses subcutaneously may be given, but chloral hydrate must never be used on account of its irritating effect on mucous membranes. In cases where there is excessive tenderness on pressure; warm fomentations or turpentine stupes, or even the application of mustard over the epigastric region often afford great relief. The animal must be kept on a low diet for some days; equal parts of milk and lime water may be given, beef tea, or finely minced, raw beef in small quantities. The after-treatment consists of a stomachic such as a combination of quassia and strychnine, or tincture of rhei and tincture of nux vomica.

CHRONIC GASTRITIS:

This disease is often the sequel to repeated attacks of the acute form; it may appear also as a secondary complication in other diseases. It is, however, generally the result of continued improper diet, associated with a debilitated state of the system.

Symptoms.—They are somewhat similar to those of acute gastritis with the difference that the appetite is not entirely lost, but is extremely capricious. Vomiting only comes on after eating, and there is no fever and seldom pain on pressure over the epigastrium. The patient gradually becomes emaciated.

Treatment.—Constipation or diarrhea must be corrected at the outset and the diet previously indicated prescribed. Internally a combination of pepsin, grs. 2, bismuth subnitrate, grs. 2 1-2, and strychnine, grs. 1-100 may be given immediately after meals three times daily, followed later with an alterative and tonic mixture such as:

℞

Tr. nucis vomicæ	drs. 4
Liqr. arsenicalis	drs. 1
Tr. gentianæ	oz. 1
Syr. aurantii	oz. 1
Aquæ, q. s.	ozs. 4

M. Give two drams three times daily.

Or

℞

Ac. nitrohydrochlorici	drs. 2
Tr. gentianæ comp.	oz. 1
Syr. aurantii	oz. 1
Aquæ, q. s.	ozs. 4

M. Give one dram three times daily after meals.

The diet must be carefully regulated to avoid a recurrence of the trouble, the animal being fed small quantities at a time and several times daily. Proper exercise, grooming with a hound glove, and sanitary surroundings are valuable aids to treatment that are frequently overlooked.

Foreign Bodies in the Stomach

The variety of substances which may be swallowed either intentionally or accidentally while at play, is so extensive as to prohibit a complete list; but sticks, stones, pins, needles, bones, coins, rubber balls, corks, etc., are among those generally met with.

Symptoms.—In many instances the patient shows no ill effects at all unless the foreign body either perforates the stomach or passing on, blocks the intestines. Silver coins may remain in the stomach for years and cause no illness whatever, but copper coins undergo corrosion in the stomach or intestine and in time cause serious illness or death. In the case of pins, hat pins and needles their presence in the stomach is often unsuspected until an abscess forms either in the esophageal region, between some of the posterior ribs or in the flank. The history of the case should be obtained and the habits of the animal inquired into, to determine whether the patient has actually been seen to swallow something, or is in the habit of picking up and swallowing odds and ends. The most prominent symptoms are attempts at vomiting, poor appetite, general dulness and depression; irregularity of the bowels, blood in the feces, general unthriftiness and emaciation.

An examination with the Roentgen rays makes the diagnosis more positive. A careful digital examination should also be made through the abdominal walls, but this is very often negative.

Treatment.—For small articles such as needles, small nails, etc., the animal should be fed on soft or doughy food in order to enclose the foreign body during its passage along the intestine. Thick porridge is of good service here. An emetic of apomorphine, gr. 1-20 to 1-10 often proves effectual in expelling blunt objects. If the emetic is unsuccessful a dose of castor oil should be administered.

In the case of hat pins, needles, meat skewers, etc., it is better to await developments since in the course of a few days the point will often work out, causing an abscess. When this is lanced, the foreign body can be grasped and withdrawn; if a hat pin, the head is cut off with wire cutters and allowed to fall back into the stomach; the abscess cavity must be treated antiseptically. The patient usually makes a rapid recovery. There is some risk of peritonitis due to these substances perforating the stomach, but it is remarkable how seldom this occurs. As a rule adhesion takes place between the stomach and the peritoneum, thus cutting off the peritoneal cavity from infection. Where large substances such as stones, rubber balls or large nails have been swallowed and the diagnosis is positive, gastrotomy should be performed without delay. A description of this operation will be given later.

Intestinal Catarrh

Intestinal catarrh is frequently associated with gastric catarrh, the etiology being the same. Intestinal parasites also play an important part in causing catarrh of the intestines. It is also seen as a complication or accessory ailment in distemper.

Symptoms.—There may be vomiting, but not so persistent or so well marked as in gastric catarrh. The appetite is impaired, the temperature is nearly always fairly high, even 103° to 105° F. The most prominent symptom is diarrhea, the severity of which may vary considerably; in mild cases the feces are pulpy in consistence; in severe cases there are often slimy, icteric, bloodstained and usually very fetid feces. Considerable pain and straining accompanies the act of defecation. There is usually an abnormal amount of fermentation, with consequent flatulence. In protracted cases emaciation is well marked and the animal presents a forlorn appearance, with tucked up abdomen, rough, unthrifty coat, and with its tail and hindquarters soiled with feces.

Treatment.—Dietetic treatment is most important and in mild cases is often all that is required. A very spare diet of finely chopped raw meat for some days is the best. Above all the immoderate consumption of water must be guarded against. If the appetite is entirely suspended, a bitter tonic should be given to stimulate it. At the outset of the disease a moderate dose of calomel may be given followed by intestinal antiseptics and astringents; salol and bismuth subnitrate, creosote, or the sulphocarbolates of zinc, calcium and sodium, combined with bismuth salicylate. Where there is much pain and tenesmus chlorodyne, laudanum or Dover's powder may be given. In cases which exhibit great weakness, alcoholic stimulants, such as brandy and port wine, must be given in conjunction with strychnine or nux vomica. The after-treatment consists in a generous but non-irritating diet and tonics.

Colic

Colic is the term here used for abdominal pain, which is of frequent occurrence in canine patients. The causes are various, the most common being flatulence, distension of the stomach or intestine, parasites, foreign bodies, violent and irritant poisons, hernia, intussusception and volvulus.

Symptoms.—The attack is sudden, the animal is very restless, yelping and crying out, trying to hide itself. The abdomen is distended, the pulse quickened and the temperature raised. Vomiting may occur if the dog takes food between the paroxysms which sometimes they will do. Eventually, if no relief is afforded, excessive prostration ensues, followed by death.

Treatment.—This will depend largely upon the cause, and may be medical or surgical as the case demands. If parasites or a foreign body in the stomach occasions the colic, an emetic should be given in the

attempt to remove the cause. Hot fomentations should be applied externally and a diffusible stimulant such as ether, ammonia or turpentine given by the mouth.

To combat the pain one-fourth grain of morphine may be given hypodermically, or chlorodyne or laudanum may be given orally. If the tympanites is very severe and persistent the stomach or the bowel must be punctured with a trocar and canula. If these measures do not give relief within three or four hours, an exploratory laparotomy should be performed without further delay; further surgical procedure depends upon the condition found. Quite a number of cases reveal nothing, but for some unexplained reason the operation nearly always gives relief from further vomiting and pain.

Intussusception

The commonest varieties of this condition are the ileocecal and the enteric. In the former the ileum is invaginated into the colon, in the latter the small intestine is protruded into itself. In some cases the invagination may be so extensive that the bowel protrudes through the anus. It is most commonly seen in puppies and young dogs, but may occur also in adults.

Cause.—Intussusception is produced by a violent peristalsis set up by some irritant, such as intestinal worms, indigestible food or drastic cathartics.

Symptoms.—The patient is seen to strain continually as if trying to defecate, but only a little fluid or dark blood-stained mucus comes away. Colicky pains develop later and vomiting occurs after the condition has lasted for a few hours. Except when straining the patient is quiet, tries to hide away and shuns companionship. The eyes are brighter than normal. Examination of the abdomen by manipulation between the fingers and thumb reveals a sausage-shaped swelling, which in the early stages is not sensitive to pressure.

Treatment.—Unless relieved, gangrene of the bowel, peritonitis and death are the usual ending, although occasionally sloughing of the intussuscepted gut with adhesion of the serous surfaces takes place, the "cast" of the bowel being passed *per anum.* It is, however, not justifiable to rely upon this remote contingency, and immediate operation should be practiced. The prognosis is good if operation is not delayed until adhesions have formed, or tissue changes have taken place, or until the patient is moribund.

Operation.—Perform laparotomy (this operation will be fully described in a future article), and replace the gut into its natural position by manual manipulation. The after-treatment is to keep the patient quiet for some days and on a liquid diet, the bowels being "rested" by the use of morphine.

Diarrhea

Diarrhea consists of the frequent passage of liquid feces, often offensive and accompanied by pain and straining.

Cause.—Diarrhea may be a symptom of intestinal catarrh or of distemper, but is more often caused by irritant food, chills, intestinal parasites, injudicious use of purgatives, or contaminated water.

Symptoms.—The evacuations are generally painful, frequent and fluid, and have a fetid odor, thirst is increased, but the appetite is often unaffected. If untreated, the animal soon becomes unthrifty, emaciated, and may even die from exhaustion.

Treatment.—If dietetic errors are suspected a full dose of castor oil should be administered, followed by chlorodyne or laudanum combined with an intestinal antiseptic, astringent and sedative as in the following:

℞

Bismuthi subnitratis	drs. 2
Ac. nitrici dil.	drs. 1½
Chlorodyne	drs. 1½
Tr. catechu	drs. 3
Aquæ, q. s.	ozs. 4

M. Give a half-ounce in water three times daily.

Or

℞

Tr. kino,	
Tr. catechu,	
Tr. opii camphoratae, aa	drs. 4
Misturæ cretæ, q. s.	ozs. 4

M. Give one dram every three hours.

Another prescription which gives good results in persistent diarrhea:

℞
Ac. sulphurici aromatici,
Tr. opii,
Spts. camphoræ, aa.....drs. 2
Aquæ cinnamonii, q. s.....ozs. 4

M. Give one dram three times daily.

If parasites are the cause, a vermifuge must be administered, followed up by a laxative and any of the above anti-diarrheal mixtures.

Where there is much fetor the zinc sulphocarbolate is particularly indicated and must be pushed until the dejections resume their normal color.

The diet must be non-irritating, raw meat being the best—milk and lime water is admissible, but large quantities of water must not be allowed.

In persistent and protracted cases stimulants may be needed and strychnine or nux vomica should be given to restore the normal tone of bowels. Astringent enemas, have many advocates, but as they produce much straining and discomfort and in reality reach only a very short distance up the bowel, they are practically valueless; except in the treatment of ulcerative conditions of the rectum, when a five- to twenty-percent solution of nitrate of silver or better of protargol, may be used.

Constipation

Constipation is the opposite condition to diarrhea, being a partial or complete absence of defecation.

Cause.—Old age and debility, paralysis of the bowels, improper diet, mechanical obstruction either by foreign bodies or by masses of indigested food, hair, bones, etc., are the commonest causes of constipation. Hemorrhoids and engorgement of the anal pouches or glands. Constipation may also be a symptom in various febrile disorders, such as distemper; icterus (caused by absence of bile), peritonitis, enteritis.

Symptoms.—The chief symptom is the more or less complete suppression of defecation. The patient makes continual efforts, but is either unsuccessful, or passes only small, dry, single balls of excrement, which are often composed of undigested portions of food and mixed with hair or pieces of bone. Sometimes it is blood-stained. At first the appetite is only impaired, later on it becomes almost or entirely suppressed. Peritalsis is absent; the abdomen may be distended with gas, but more often it is tucked up and hard. On palpation a hard sausage-shaped mass may be felt in the abdomen, sometimes extending as far forward as the ensiform cartilage. Manipulation is usually painful. The temperature is raised slightly and upon introducing the oiled finger into the rectum the accumulated fecal mass may be felt. The animal is depressed, and may have colicky pains. There is a peculiar carriage of the tail, which is characteristic of this ailment.

Treatment.—This depends largely upon circumstances. In the constipation found in the course of fevers, etc., the condition does not get so far as the formation of the "fecal tumour" above described, and a mild laxative is all that is required in ordinary cases.

Foreign bodies may require surgical interference if laxatives do not bring about the desired result, but in no instance should drastic purgatives be given. In peritonitis and enteritis, if the case demands the correction of the constipation, enemas alone should be relied upon to empty the bowels.

In old, debilitated, and improperly fed dogs, where the fecal tumour is well marked, and there is marked absence of peristalsis (paralysis of the bowel), small repeated doses of olive oil and strychnine gr. 1-100 to gr. 1-60 must be administered. Enemas of warm oil should be injected three or four times daily to soften the impacted mass and the abdomen gently massaged to stimulate peristalsis. Where the impacted mass can be reached, it must be removed piecemeal, either with finger, a rectal spoon, or, best of all if available, by an instrument known as French's rectal curette, which is a blunt curette having a hollow shaft and an opening in the spoon portion. A rubber tube is attached to the shaft and a continuous flow of water, obtained from an elevated douche can, washes away the particles removed by the

(*Continued on Page 615*)

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the veterinary profession and the lasting gratitude of those who are aided by your suggestions.

The Administration and Value of Tetanus Antitoxin

THE growing practice of giving tetanus antitoxin for curative purposes by the intraspinal route receives increasing support from both the statistical and the experimental sides. Numerous observers have corroborated the findings of Meyer and Ransom and others, that the tetanus toxin is absorbed from the infected wound along the nerves, and spreads into and through the spinal cord by direct extension. Toxin traveling along the nervous tissues is not readily neutralized by antitoxin in the blood, but antitoxin in the spinal fluid can meet the toxin in the nerve roots, and probably in the cord itself.

A series of interesting studies by Permin establishes these facts and adds some new ideas. He found that animals given large doses of tetanus antitoxin, and then injected into a muscle with three or four times the ordinary lethal dose, develop a local tetanus from the excess toxin which passes along the nerves and reaches the regional segment of the spinal cord without being neutralized. Intraspinal injection of antitoxin can prevent the passage of the toxin into the cord, and thus prevent the local tetanus. As others have done, Permin attributes the universal tonic spasm of general tetanus to multitude ascending spasms; but the convulsions he ascribes to irritation of the cerebrum, on the basis of experimental evidence obtained from decerebrated animals, and by intraocular injection of the toxin.

Antitoxin circulating in the blood after subcutaneous or intravenous injection has no demonstrable power to abstract tetanus toxin from the nervous tissue, and hence is powerless to prevent the action of this toxin. All that antitoxin can do is to saturate the toxin being formed in the site of the infection before it has entered the nervous tissues, and thus prevent in some cases the absorption of the fatal dose. When present in the spinal canal the antitoxin can also neutralize the toxin which is being carried into the cord from the nerves, thus interrupting the poison before it reaches the place where its harmful action is developed.

The prophylactic use of antitoxin depends on the binding of the toxin before any toxic quantity can be absorbed by the nervous tissues, and apparently is not associated with any considerable effect on the infection, in view of the reported cases in which a delayed tetanus has been observed after prophylactic use of antitoxin, presumably arising after all the injected antitoxin has been eliminated or neutralized. From the results of experimental studies, which are supported by such statistical evidence as is obtainable, the proper curative treatment in a case of actual tetanus should consist, in addition to radical cleansing and extir-

pation of the infected tissues and symptomatic sedative treatment, of the use of maximum quantities of tetanus antitoxin by both intraspinal and intravenous or subcutaneous routes—the former to block the passage of antitoxin from the nerves into the spinal cord, the latter so to saturate the blood and tissues with antitoxin that no more unbound toxin can enter the nerves [at the site of infection]. Patients so treated, who have not already a fatal quantity of toxin in their spinal cords, should recover in most if not all cases.

Statistics on the use in Denmark of tetanus antitoxin for curative purposes, largely by the simple subcutaneous route of administration, give encouraging results, which would probably be even better if the more vigorous methods were employed. Of 199 patients treated without antitoxin there were twenty-one percent of recoveries, while in 189 cases of quite similar incubation period in which antitoxin was given, 42.3 percent of the patients recovered. It is especially noteworthy that in the acute cases with an incubation period of less than ten days, which have a notoriously bad prognosis, ninety-two patients treated with antitoxin showed 27.2 percent of recoveries, while of ninety-four untreated patients only 5.3 percent recovered. If tetanus antitoxin has so much influence on mortality when it simply limits absorption from the wound, its effect will undoubtedly be much greater when it is also used to block the progress of the toxin already absorbed.

In any case, the results of these and many other statistical studies leave no room for doubt that tetanus antitoxin is well worth while as a curative agent in developed cases. In its use as a prophylactic agent it must always be kept in mind that tetanus antitoxin does not remain long in the body; Ruediger found that in guinea-pigs the protective influence is lost in three weeks, while Vaillard states that in man it lasts but one or two weeks. Hence, in those cases in which complete removal of the infecting bacilli cannot be assured, a repetition of the injection is necessary. Cases of tetanus developing some weeks after prophylactic use of antitoxin are occasionally observed, and are undoubtedly due to neglect of this precaution.—Editorial in the *Journal of the American Medical Association.*

SEIZING THE OPPORTUNITY FOR VETERINARY LEGISLATION

My purpose in this short article is to speak trenchantly of three points. First, I may discuss some important bills in Congress, known or unknown to the veterinary profession, which either continually failed for a while, but finally succeeded, or which will succeed; second, of the peculiar circumstances at present which favor the passage of the army veterinary bill; third, of the plan of the profession to seize the opportunity, now presenting itself, for veterinary legislation.

Men, momentarily discouraged by hindrances which meet them in their ambitions to "go up higher," are apt to forget the fact that there is nothing which man has gained, which is worth the having, that he has not had to fight for. This is true of all the best legislation and it is bound to be true of army veterinary service legislation as well. There is great danger that the constant appeals for support of the army veterinary service bill, H. R. 4541, which in another form in the 62nd Congress met with a temporary setback, will pall upon us. That, above all things, is to be avoided; and it can be done by our being kept mindful of the first point I an endeavoring to make, namely, that our bill is only running the same course as other bills did which are now law and are accounted beneficial the country over.

Take, for example, the Federal Food and Drugs Act, which became law June 30th, 1906, the same day as the Federal Meat Inspection Law. This law, which struck at adulterations, misbranding and mislabeling, which revolutionized the food-making industry of our country, only became a statute after being worked upon as a bill in Congress for fifteen successive years. It took from 1891 to 1906 to secure federal meat inspection legislation of a type satisfactory to the people: for the experience of all those years was necessary

to cause America to discover what an adequate meat inspection meant. When it took so long to pass these two laws, in which veterinarians are so much interested, under response to a national demand, why should we be discouraged by our momentary setback in our attempt to secure army veterinary service legislation? Again, the pay clerks of the army, though civilians, are now pseudo-officers with the pay and allowances of first and second lieutenant in the army. But they worked practicaly politically over twenty years before they secured that standing—and they are not professional men in any sense, only clerks. Surely the veterinary profession is not petitioning Congress for much, when, under the Hay bill, it asks, in addition to the grade of first and second lieutenant, which mere pay clerks have had for two years, that veterinarians be given *commissions* as first and second lieutenants and captains? Military legislation, such as this obtained for mere pay clerks, is notoriously slow. The War Department, for half a century, has been trying by all means in Congress to establish the militia of the states as a second line of defense, under Federal pay, the national guardsmen, in the plan, to be required to serve under the colors, in case of war, at home or in a foreign land. A week or two ago this question came up again before the national convention of state militia, held in Chicago, only to end in fiasco. It took from 1865 to 1901 to get Congress persuaded to increase the size of the standing army of the United States from 25,000 men to its present strength. The question of the reduction of army posts in number and concentration of the troops in larger posts for military advantage has been argued before Congress for many years and it is being argued by Secretary Garrison and General Wood today. If all matters of greater moment to the nation and to the military establishment took so many years before they could be settled, some of them being still unsettled, the veterinary profession should not have its ardor for its legislation dampened by a momentary setback, now, when it has worked for this legislation as many as a dozen years. It was the great Frenchman, Tallyrand, who said that, "some defeats are greater than most victories." This is true of our experience in the 62nd Congress.

For, consider the second point—the peculiar circumstances at present which favor the passage of the army veterinary service bill. Nothing succeeds like success, and we are in the favorable position of having been successful with our bill in the House of Representatives last session. Those who succeed are entitled to respect and this will have its effects when the army veterinary service bill comes up before the House Committee on Military Affairs in the winter. In addition to that the leader for the Government in military affairs in the House, Mr. Hay, not only favors the bill but introduced it himself, which is, as a high government official has said, "half the battle won already." Again the majority of the House will not vote against a military bill of this kind introduced and pushed by its leader on military matters and passed by the House Military Committee, as it is likely this bill will be. Consider further that when the Hay bill goes up for action in the Senate it will at once be turned over to the Senate Military Committee, the majority of which, including the Chairman, Senator Chamberlain of Oregon, are of the same political complexion as the House Committee on Military Affairs. This is just how our bill failed in the last Congress. Though our bill was not in any sense a party measure, in the last Congress the Republicans of the Senate contrived to asphyxiate it, simply because it happened to pass a Democratic House. If we rally together, as we will, and show the Chairman and at least the majority members of the Senate Military Committee, who naturally will look with favor upon a military bill which has passed the House, that our measure is in high degree valuable to the army as one which harmonizes with their views of its conduct, as well as brings relief and belated justice to our profession in the army, it should pass the Senate Military Committee and the Senate.

There is still another reason why we should expect to fare better in the Senate than we did in the last Congress, and that

is because of the pronouncement of a majority of the states for popular election of Senators, which thus amended the American constitution and made this principle, after the recent action of Congress, a new part of our national constitution, immediately effective. Self preservation is the first law of nature. Every Senator wants to be reelected when his term of office expires. Every Senator now seated knows that in future he can keep his seat only by being elected directly by the people the same as a Representative. He is answerable for his actions to the people direct and subject to recall. The time will come soon when "Bristowism," as it is described by Dr. Hoskins in his report as Chairman of the Legislative Committee of the A. V. M. A., given in New York, will be no more.

Dr. Hoskins said:

"As Chairman of the Committee I wish to point in conclusion to one phase of the failure of popular government, that every citizen of our fair land should be awake to, and which calls for personal duty, that does not cease now by the election of United States Senators by popular vote.

"It is a fact that a sub-committee, yes, one man of a Senate Committee, may deny relief to the people, even though the people's representatives speak unanimously in behalf of a measure. Let me be more specific:

"Senator Bristow, a member, Chairman of the sub-committee of the Senate Military Committee, by his defiant action in refusing to call the sub-committee together for action, by which a vote could have been taken on the army veterinary service bill, set at defiance the expressed will of the people.

"To correct this great wrong to our profession. No man is greater than his country and no man greater than the cause you and I represent. We were entitled to a report from that sub-committee and no people's representative was justified in denying the same. An adverse report by the sub-committee would have afforded us an opportunity of testing the attitude of the Senate Military Committee as a whole, more than a majority of whom had expressed themselves as favorable to the bill and I believe would have approved the House Bill.

"This subterfuge, by which we were denied a hearing by the Senate in behalf of our measure, presents such a menace to popular government, that it behooves every man interested in good government to actively protest against such condition.

"Popular elections of our Senators has not come too soon. The recall of all such officials recreant to their trust will as surely follow, when once the people learn of the rabitrary power that can be exercised by one man."

Senators henceforth will want to get the people's votes instead of those of members of state legislatures. They will listen to what the people say, else the knell, indicating the approach of their downfall, will ring—a fearful thing to contemplate. We, therefore, as part of the people, can now approach our senators with more confidence of success. We can then vote directly against such a man as Bristow and such an abhorrent thing as Bristowism, and cause the one to topple to earth and the other to disappear.

And this brings me to my third point—the plan of the profession to seize the opportunity, now presenting itself, for army veterinary service legislation. With all these things in mind we are going to proceed with confidence and with the courage of our convictions. Thousands of letters have already been sent out by the Legislative Committee of the A. V. M. A., calling upon veterinarians everywhere to get acquainted with their Senators and Representatives with the object of informing them of the terms of the army veterinary service bill and its aims. This bill, to consolidate the veterinary service, U. S. Army, and increase its efficiency (H. R. 4541) will come up for action in the winter session of Congress which begins in December. A far more widespread campaign will be carried on by the profession and its friends amongst members of the 63rd Congress than was done amongst members of the 62nd Congress. The veterinary profession surely has as large an acquaintanceship and as large a body of friends interested in it and its work as has the dental profession, which

was able to get commissions as officers for its members in the army. Our friends and our friends' friends working with us are together a host which can impress Congress with the importance of the legislation we demand. Let us seek the aid of our friends —this is the shibboleth which has the sound of success in it. The day of success is just ahead of us. Do we see it? Will we seize the opportunity for veterinary legislation now before us?

GARRISON STEELE, M. D., D. V. M.

A VETERINARY MEETING AT COLLINSVILLE, ILL.

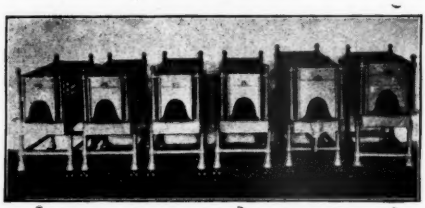
In order that we will not disappoint any, if we fail to send invitation, I wish you would insert in your November issue that there will be a veterinary meeting (just a get together, where everybody has the floor), Collinsville, November 15, 1913. Clinic from nine to twelve a. m. Program at the city hall in the afternoon. Everybody welcome.

L. B. MICHAEL.

Collinsville, Ill.

A NEW BLEEDING CRATE

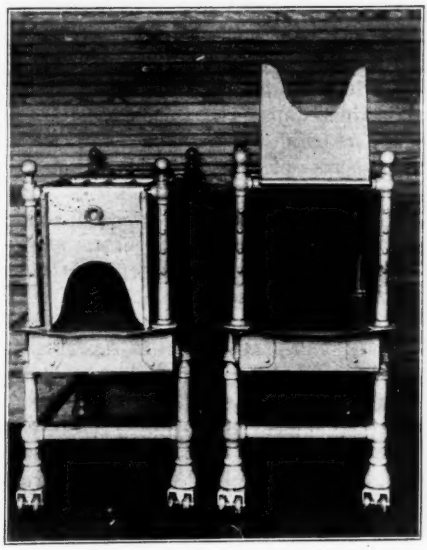
The improved bleeding crate used by the Illinois Laboratory in the production of antihog-cholera serum was constructed by Dr. L. L. Conkey, of Holland, Michigan. This crate is just what the photograph



Six Bleeding Crates built for the Laboratory of Illinois Live Stock Sanitary Commission, by the Veterinary Specialty Mfg. Co., Holland, Mich.

shows. A very complete, up to date contrivance indispensable in any up-to-date laboratory of this kind.

It hold s the hogs in position, is humane in its application and does not, in any way injure the hog. It has the great advantage of not being cumbersome. It is made of steel bars and permits nipping the tail to the very closest possible point, so that if one bled a hog only five times, with the ordinary crate, with this one he can bleed it six times at least. In other words, it



THE PETER'S BLEEDING CRATE, OPEN AND CLOSED

gives you the advantage of one more bleeding.

The crate is mounted on casters and can be moved easily in the smallest possible space; it is attractive in appearance and can be cleaned up in a very short time. These crates were designed by myself, my assistant and Dr. L. L. Conkey of the Veterinary Specialty Company. I may say that Doctor Conkey is perfecting a hyper-immunizing crate for us which we hope will be available for use soon.

A. T. PETERS,
State Biologic Laboratory.

Springfield, Ill.

A CASE OF MISPLACED LIVER

On September 2nd I was called to see a patient, said by owner to have had "kidney trouble" for several hours.

I found a bay horse, seven years old, in good flesh, used for heavy hauling. The animal was pawing and looking around at

his flanks, but showing no inclination to lie down. The temperature was 102.4° F., breathing very rapid. Upon making an examination per rectum I found the liver attached to the left sublumbar and left hypochondrium.

The hand could be passed between the abdominal muscles and the edge of the organ to the extent of about three inches, when it met with the attachment to the abdominal wall. The spigelian lobe was easily reached. I could not reach the lower border of the liver as it lay too low in the abdominal cavity.

The horse was suffering from impaction and made a nice recovery.

GEO. P. FROST, M. D. C.
Chicago, Illinois.

THE TREATMENT OF BURSATTE

At different times I have treated a considerable number of cases of bursatte and have tried many different methods and with varied success. Among the drugs used are formalin of various strength, saturated solution of picric acid, and arsenic. I have excised the diseased parts and also have used the actual cautery, but the treatment which seems to have given me the best results is arsenious acid, used as a powder over the granulating surface of the ulcers. One application usually is sufficient. Immediately the discharge ceases and the parts become dry and a considerable area of tissue becomes necrotic and sloughs out.

As soon as the slough becomes loosened it should be cut out to the healthy tissue and the parts will heal as readily as any wound with ordinary antiseptic treatment. This does not seem to affect a permanent cure. Although one is able to cure up the ulcers for the time, others are liable to break out with the advent of the summer season, which would indicate that this disease must have a dormant state within the animal's system.

I report this line of treatment as I have never seen any mention made before of the use of arsenic in these cases and I hope others may be benefited by employing it.

To any one who would hesitate to use it in these cases on account of the slough it may cause I would say that the disease will soon destroy more tissue than the arsenic.

CHAS. H. JEWELL,
Veterinarian 11th Cavalry, U. S. A.
Fort Sill, Okla.

DISLOCATION OF THE CARPO-META CARPEL JOINT*

I was asked to see last April a bay pony which had got entangled in an iron hurdle, and had injured itself. Upon examination I was surprised to find that the knee-joint was dislocated, the leg being bent at such an acute angle that it was almost impossible for the pony to get the toe of that limb on to the ground: and, figuratively speaking, one could hang one's hat on the proximal end of the metacarpus. I tried in vain for half-an-hour to reduce the dislocation, and at last went home to get my hobbles and chloroform apparatus. The pony was cast very easily, leaving the affected leg unhobbled, and much to my sirprise, on examining the limb directly afterwards, found that the dislocation had reduced itself. The pony was naturally stiff for a few days, but made an uneventful recovery. My reason for recording this case is its rarity.

WILFRED WALTERS, M. R. C. V. S.
Blofield, Eng.

A PECULIAR CRYPTORCHID FORMATION

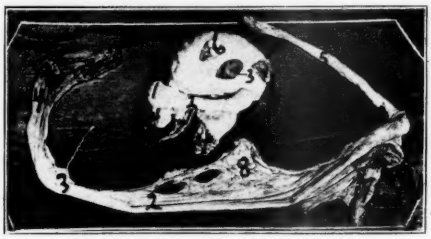
I enclose herewith photo of the testicles from a two-year old, left single ridgling, 1300 pound Percheron colt, color sorrel, castrated about May 15, 1913. Result perfect.

As may be seen by the illustration a bony dermoid was formed in large testis that was found pendant in usual place.

The other testicle from head of epididimus to the spermatic cord measured thirty-two inches and was entirely within the abdominal cavity, occasioning considerable difficulty in identifying its various parts, even after removal, although when hardened by formaldehyde solution the parts come out a little better.

*Reprinted from *The Veterinary News*

There was no apparent inguinal ring either external or internal on the cryptorchid side, the region being filled with



DR. KNOWLES' SPECIMEN

1. Head of epididimus (globus major). 2. Body of epididimus (globus minor). 3. Testis proper. 4. Spermatic cord. 5. Vas deferens. Owing to its size and development you will see that about ten inches of vas was removed thinking that perhaps this vas which was as large as the little finger should be removed to make the castration complete. It was two feet eight inches from the head of epididimus to spermatic cord (3) of the hidden testicle when removed. 6. Dermoid—bone. 7. Attachment of tunica vaginalis to testicle and of hidden testicle to side of pelvis. 8. Fold of tissues that were found enveloping hidden testicle and connecting it with side of pelvis

dense tough inelastic tissue. The attachments and adhesions along whole testicle made its enucleation and removal extremely difficult.

C. B. KNOWLES.

Sioux City, Iowa.

SOME QUESTIONS OF DIAGNOSIS AND TREATMENT

I was called to attend a sick horse, with the following history: About 4 p. m., he had staggered and fallen, got up, shivered, staggered around and in about half an hour fell again and did not get up till 9 p. m. I arrived at 6 p. m. The horse was lying down, temperature 108° F.; pulse, fast and weak; breathing, fast and difficult; skin, hot and dry. The owner had driven this animal hard on a hot and sultry day. I diagnosed the case as one of overheat.

Treatment.—I gave the horse one-half grain of arecoline, one-half grain of strychnine, one-quarter grain of glonoin, poured water on its head and gave thirty grains of quinine. He seemed to get along fine. In two hours' time the temperature was down to 103° F., and at 9 p. m. he got up, but was weak and could not control his gait, and walked sideways. I left some tonics with the owner to be given during the night. The next morning he called up, saying the horse seemed to be well, except he walked like he was drunk. I went out again. This time the horse's temperature was 102° F.; pulse normal; breathing fast, and the animal seemed to be blind. I gave some stimulating medicine, and about 3 p. m. he walked out of the stall to the watering trough, where he fell over dead. What was the cause of this sudden death?

Case 2.—A horse has swelling on lower maxillary bone. It comes on in two or three days and is as hard as bone, immovable. The swelling is of same character as lumpy jaw in cattle. It is very painful to touch. Will anybody tell me what it is?

Case 3.—A twelve-year-old mare which had a running sore on forearm of about six months' standing. I tried every treatment I could think of, but it would not heal. It was discharging constantly. I collected one ounce of discharged pus in a clean bottle, adding one-half ounce of pure carbolic acid, then added enough water to make six ounces, and gave the mare one ounce every morning, and in six days the discharge stopped and healed up in short order. What cured her?

FRANK H. SCHROER.

Botkins, Ohio.

[It is a less difficult matter to say what *didn't* cure No. 3, and that is your treatment.—ED.]

INFECTIOUS ABORTION

Experience has taught not only the dairyman, but the veterinarian, that infectious abortion when once it has gained a foothold in a herd, is a disease of great importance. Not only should veterinarians consider the financial part, but take into consideration the great loss of valuable offspring and of milk products.

The fact, that if one animal in the herd aborts, from infection, and is neglected, that the remainder of the herd will probably also abort, and the failure of medicinal agents administered orally, subcutaneously (serum), or in the form of douches to

readily cure or produce an immunity, adds to the importance of the study of this disease.

In stating that when one aborts the remainder will probably also abort, I mean, only those which were exposed to the infection when bred or after calving, not those exposed after the uterine seal had formed.

It has been demonstrated that the only probable source or mode of infection is by the introduction of the bacteria into the vagina or uterus; I consider this the true source. These facts and being unable to diagnose it (symptomatic) until abortion cannot be prevented, would suggest for a definition of this disease, one worded as follows:

A highly infectious disease, caused by the abortous bacillus and other bacteria, disseminated by the act of copulation and cohabitation. Pathological lesions attacking the maternal and fetal membranes, producing in utero the condition, "gangrene."

Expulsion of a diseased live or dead fetus at any period of gestation. Period of incubation unknown. Constant immunity cannot be acquired and passive (?) of short duration. Very resistant to all forms of treatment.

Etiology.—Infection of the uterus of the cow or the penis of a bull with the abortus bacillus during the act of copulation, smearing of the buttocks of a healthy cow with the discharges on the tail of an infected one, lying in discharges, dissemination and transmission by attendants while grooming or milking, brooms, brushes, shovels, syringes, irrigating tubes and experimental uterine and vaginal inoculation. There are many other ways and means by which the infection might be carried, but none so common as those mentioned, yet all should receive due and proper attention as they present themselves.

Symptomatology.—The bull, the most important factor in the transmission of this disease, gives very little if any indications of being affected. There may be at times a discharge from the sheath, which is of an unhealthy nature, otherwise there seems to be no deviation from his normal health and habits.

When abortion takes place in a herd, there is one condition which cannot be mistaken as a pathoneumonic symptom, namely, two or more abortions, not due to injuries or other known causes.

Preliminary to the act of aborting or at any time, should the cow be infected or suffering from the disease, the following pathoneumonic symptoms can be observed. A discharge from the vulva of a leukorrheal nature tinged with dark colored blood, catarrhal condition of the vagina, the appearance of nodules on the mucous membrane of the vulva and vagina, especially well marked on the labia and inferior commissure of the vulva. As the disease advances these conditions become more marked, anorexia and pyrexia develop; also signs of parturition are presented and abortion takes place.

Abortion may take place at any time during pregnancy, from two months until full time. A live calf may be born any time from the seventh to the ninth month, but usually succumbs soon after birth. The placenta is retained and if removed immediately after parturition, it will be found that decomposition has already taken place, having existed some time previous to the abortion. The longer abortion is delayed the more serious do the symptoms of disturbance become manifest in the dam, absorption of the septic matter in the uterus will have taken place and the dam often succumbs to pyemia.

Early abortion hardly ever causes much disturbance of the general system, other than the fetid leukorrheal discharges. The sequels of infectious abortion are many and always of a serious nature, the most common are, mastitis gangrenosa, pyemia, septic metritis, vaginitis and leukorrhea.

Therapeutics and Sanitary Hygeine.—If the bull is a valuable sire and it is desired to keep him for future service he should receive our first attention, otherwise he should be sent to the butcher and slaughtered. Allow him no service for at least three months and then only to healthy cows, during this time he must receive a *daily* treatment for two weeks, then at

intervals of three days until considered free from disease.

The treatment which I will recommend has proven most efficient in my ten years' experience in a badly infected district. Irrigations of the sheath with a chinosol solution 1-500, injecting enough to ballon the sheath, which is easily done by holding or lightly pinching the opening, allow it to remain in the sheath as long as convenient. Wash the belly, tail, all four legs, feet and muzzle with any reliable germicide, then remove to new non-infected quarters. Thoroughly disinfect or fumigate his pen or stall and white-wash, burn all litter and bedding. Administer internally, methylene blue (medicinal) in 20-grain doses every other day until five doses have been given. A cow that has aborted should be removed from the herd immediately, her stall and all surroundings thoroughly disinfected, the fetus, placenta and bedding *burned*. When removing the fetus and placenta from the stall do not drag them along the floor, but remove them in something that will not allow any draining, confine the infection to as small an area as possible. For disenfecting the stall use sulphuric acid, strong enough to turn white pine yellow, or carbolic acid, copper sulphate, formaldehyde, or quicklime.

Whatever is used for this purpose, use it strong enough so there will be no doubt about it doing the work and doing it well. The floor and partitions of the stall must be properly and thoroughly disinfected. The vagina and uterus of the aborting cow, after removal of the placenta, (which should be removed at once) should receive a flushing and irrigation of a warm chinosol solution 1-500, this irrigation repeated each day until discharges cease.

I recommend chinosol for this purpose because it is reliable, non-irritating and non-poisonous although a little expensive. Care for the external parts of the cow the same as recommended for the bull, washing the belly, legs, udder, vagina, and tail. Administer internally ten to fifteen grains of methylene blue once a day for three days then every other day until ten doses have been given, repeat after two weeks if necessary.

Abortion does not interfere very materially with the rutting period but the infected cow should not be bred under any conditions. When a cow has aborted and is thought to have become normal again, is bred, the bull's sheath should receive the same attention and irrigated after service. Attention should be given the bull's sheath after service to any cow from outside herds. All instruments, tubing, syringes and garments used during or in the treatment of abortion, should be sterilized after each operation. Attendants must be warned and given proper instructions about their being fomites, not to mingle with the infected and healthy stock without first taking proper antiseptic precautions, disinfecting their hands, clothing and boots. For the pyemic condition, indicated by pyrexia (104°-107° F.) anorexia, debility and fetid discharges from the uterus, which oftimes is the sequel of abortion, due to the absorption from the uterus, give, Quinine sulphuric one dram, sodium salicylate one dram, strychnine sulphate one-half grain, every four hours internally and warm chinosol irrigations of the uterus every four hours until temperature becomes normal.

G. E. Corwin, Jr., D. V. S.
Canaan, Conn.

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Since the foregoing article was received, Dr. F. A Rich, veterinarian to the Vermont Experiment Station at Burlington has published a bulletin (No. 174) on "Methylene Blue—A Remedy for Infectious Abortion" in which he says:

"The discovery of an adequate remedy [for infectious abortion], one which is safe, simple and sure, would be a great boon. As a result of several months' trial at this Station it is believed that such a remedy has been found in methylene blue, an antiseptic dyestuff occasionally used in human medicine."

From the above article it would seem that priority in the use of methylene blue as a treatment for contagious abortion lies with Doctor Corwin. However the method, or at least the dose given by Doctor Rich differs materially from that advocated by the former. While the latter advocates

ten to twenty grains as a dose, once daily or every other day, Doctor Rich believes best results are obtained from a dose of ten drams, twice daily, and in some cases gave as much as sixty drams at a dose.

At the Vermont Experiment Station methylene blue has been in constant use since October, 1912, in the treatment of four herds in which contagious abortion was known to be prevalent, and no cases of abortion have occurred.

SEDATIVES vs. PURGATIVES IN IMPACTIONS IN THE HORSE

IN THIS part of the country, grain hay is the principal forage crop for horses. Usually, wheat or oats, just turning from the "milk" to the "dough" is cut and cured, and this, with rolled oats or barley, forms the diet for the majority of horses. In some of the "logged-off" lands, where there is considerable moisture, timothy is abundant; and in the dry-farm regions, alfalfa is the chief hay.

There are very few cases of impaction where timothy and whole oats are fed, but with grain hay the tale is different. Then again, the class of horses play a considerable factor in the case. The common cayuse or Indian pony can be galloped forty miles, then staked in the rank, damp grass, filled up on water, and no trouble ensues. Try this on the ordinary ranch horse, or even give him a bundle of green grain hay, and the results are different. As the old pioneers mournfully say: "Hosses ain't what they used to be when they was raised on bunch grass and scenery!"

And this is evidently true. The progeny of "hot-house," imported stallions are now delicate, chunky animals without much vitality or resistance to disease. It is the writer's conviction that the type of horse and its stamina have often more to do in overcoming severe acute disorders than does medicine, although both intelligently combined lead to success.

The history of grain-hay impaction is familiar to every veterinarian practicing in the West. Usually, when the roads are the muddiest, the night the darkest and the weather the stormiest, the 'phone rings. Frequently, the voice is that of a woman, for the men folks have formed a rural board of strategy by the bedside of the stricken horse, and are taking turns in pouring down "what the doctor-book says." The slumbering veterinarian is aroused from a sweet dream of a rancher paying him fifteen dollars cash for a call. He wraps the drapery of his shattered reverie around his shivering form as he listens to Mrs. Rancher's tale of woe:

"Yes, the horse has been sick ever since day before yesterday, but after her brother-in-law's cousin, 'who once lived with a veterinary two weeks,' gave it half a gallon hot lard, two pounds of salts, half a pound of niter with a teaspoonful of aconite, it seemed to get better. Then, they gave it sour milk, sody, laudanum, Gombault's caustic balsam and half a bottle of Kendall's spavin cure internally, rubbing sweet oil and vinegar, half and half, over the kidneys."

As the animal was somewhat diffident in swallowing, they poured melted "rosim" into the nostrils, and twisted both ears, while a strong-armed horny-handed son of toil held up the patient's head until its nose nearly touched its croup.

"Yes, it was getting worse, and they thought it was dying, but they waited all day to see how long it would last before they had to get a veterinary. No, they didn't have any linseed oil, but they were just giving some oil they had skimmed off a bucket of paint, with some more niter."

Hanging up the receiver, the joyful veterinarian warms himself with a few appropriate remarks, slides into his clothes, grabs his grips, hitches up, and is off. As Byron so truly states: "There is a sound of revelry by night," that can be heard for half a mile. All the neighbors have gathered in, for the party telephone is worked overtime. Venerable fathers in Israel stroke their beards and look doubtfully at the youthful veterinarian. The owner and several others, covered with the majority of their misplaced drenches, look disgusted, while the poor victim of their generosity takes turns in kicking, rolling, or standing still in deadly fear of more dope.

"Ef we jest had some whiskey!" mournfully sighs an old grizzled pioneer, whose thoughts may stray from the horse to himself.

This is the scene that confronts the veterinarian, and the familiar symptoms are ever present: Temperature about 102° F.; pulse sixty to seventy; respirations forty to fifty; ears and nostrils cold; mucous membranes injected; no peristalsis perceptible, except a slight tinkling in the right flank; rectum empty; no bowel movements; sweating, with alternate chilling; restless, with pawing or kicking and rolling, followed by periods of rest and quiet. He stretches out as if to urinate:

"It's his water, ain't it, Doc?" queries the owner. As he pays the bill there is no use in starting an argument.

With a wise, serious, ten-dollar look, the veterinarian nods his head.

"I knowed it wuz!" conclusively avers the hired man, who feels kindly disposed toward the veterinarian for confirming his diagnosis.

The scanty urine voided is discolored and of a brownish hue. This is not to be wondered at as they have kept water away from the animal ever since he was sick. The reputation of the veterinarian is now at stake, and one of my reputations was badly damaged when I administered a grain of arecoline in a case like this. Had I not taken the precaution to warn the owner that collapse was imminent any moment, he would have always blamed me for the sudden decease. A study of psychology is as essential as that of materia medica.

I used to treat these cases with purgatives, rectal injections, with drenches of linseed oil, ammonium carbonate (following the Reeks' treatment), aloetic balls, ginger, etc. Of the hypodermics, I had used arecoline with or without strychnine and pilocarpine. After standing by the bier (it was in a "dry town," however,) of three patients in succession, I changed to eserine, making it up in chloroform water or straight. One more subject for a freshman dissecting room occurred, followed by two recoveries. I was jubilant. At last I had solved old Impaction's curves, but in a few months my batting average was again .223. I began to wish I was married and had a wife who would sweetly whisper: "Doctor is out on a call," to these summons. I studied Winslow, Quitman and Hare; pored over Merck's Index for something new, and then started in on the U. S. Dispensatory. I receive all the veterinary journals and several of the medical ones, and carefully scanned these.

Finally, in *The Journal of the American Medical Association*, I read an article by a North Dakota physician relative to his experience with purgatives previous to surgical operations. He stated such agents as calomel, etc., seemed to inhibit the secretion of the intestinal juices and increase inflammation. He mentioned the difference in results he had from emergency surgical cases, where no cathartics had been given, to those of his patients who were thoroughly prepared by having the bowels cleansed with calomel, castor oil, saline injections, etc. He especially noted the difference in tympanites after the operation, in favor of the emergency cases, and his conclusions were that it did not pay to try to improve on Nature. This rational article by some intelligent physician and surgeon, whose name unfortunately cannot be recalled and due credit given helped me immensely.

Later, if I recall correctly, in the AMERICAN JOURNAL OF VETERINARY MEDICINE, some writer (whose name also cannot be recalled) made this statement:

"Inflammation is more often the cause of constipation, than is constipation the cause of inflammation." This soaked into my cerebrum and made a few needful convolutions. Not long ago, an article, "Equine Typhlitis," appearing in the *American Veterinary Review*, by Dr. Willis Wilson, Dayton, Washington, described very nicely what I was up against. Dr. Wilson is located about a hundred or so miles from here.

Then, in a letter from Dr. D. O. Kniseley, of Topeka, Kansas, he mentioned antiperistalsis. On postmortem I found this evidently to be true.

So I began on a new trail. I studied carefully the action of sedatives on the

alimentary canal, and resolved to give them a trial, following with mild laxatives. The first case was a typical one in a nervous driving horse. He had been sick for nearly two days, and had been given a liberal portion of all the medicinal agents known to the neighborhood. Fortunately, he was still very restless, and, giving a grave prognosis to protect me in case my experiment failed, one H-M-C tablet with one-half grain pilocarpine was hypodermically administered in the breast. The stomach tube was then passed (to the great amazement of the onlookers) and the stomach flushed out. A warm saline enema was next given, and several men started in to rub the animal. A bucket of water with the chill taken off was left in the manger, a blanket put on the animal; fresh bedding ordered; bladder emptied; and finally, about one-half hour after the first one, a second H-M-C tablet given. All of us then went into the house for a meal, and absolute quiet reigned in the barn. I was afraid the animal had passed on to that bourne from whence no cayuses ever return, but on going to the barn, I found him quietly standing, with his hindquarters slightly elevated, which seemed the most restful position. To make a long story short, he recovered. No other medicine was given. About eight hours later, a drench of a dozen raw eggs was given.

In my last series of thirty-odd cases, only three have died, and these had generalized peritonitis before treatment was commenced. I usually order a dozen raw eggs beaten up given as a drench six to eight hours after first treatment. The higher priced eggs are, the more efficacious they seem to be, but perhaps they do their part in soothing the inflamed mucous membrane. The pilocarpine may flood the bowels with fluids, but I cannot say as to this. Beautiful theories in textbooks and actual experience in general practice are sometimes two different things. So I do not offer any theories.

From my experience, drastic purgatives are as liable to cause a funeral as a cure. They seem to increase the zone of intestinal inflammation, and the corresponding contents become harder and drier from the resultant increased temperature. A purgative in the *first stage* may dislodge the impaction and hasten recovery, but not after a period of sickness.

The physician does not administer a drastic purgative to a person who is violently ill or nauseated. Instead, sedatives such as cerium oxalate, or cocaine; carminatives, as peppermint or capsicum; anti-emetics as quiet, bromides, morphine, bismuth, etc., followed with mild mechanical laxatives, are given. In intestinal impaction one cannot hope to overcome the condition without first allaying the inflammation.

Morphine, atropine and aconitine (Knowles) has given excellent results, following with bran mashes; and possibly any of the sedative group such as hyoscyamine or atropine might do as well.

As you well know, the disease or group of diseases enumerated above vary considerably from the "Back-East" timothy or clover colic.

Another thing: Read as many medical journals as you can; associate with up-to-date physicians, and you will be surprised how many helpful hints you will glean from them. I have never believed in the livery stable office or the loud-swearing, tobacco-stained "vetinary" whose rubber collar is changed twice a year, and whose sole dependence is in "physics." It is no wonder the veterinary profession has the standing it has, but one is thankful to see its steady advancement. In no way can one attain professional reputation than to achieve results in a skilful, business-like manner, different from what any stable man can do. Too many veterinarians kill an animal in the process of curing; others leave the animal writhing and sweating in agony. If physicians would do the same to their patients, what would we think? Assist Nature and do not inhibit Her wonderful recuperative powers with as much "dope" as the average owner wants to give. A harmless vegetable coloring matter combined with *aquae* often achieves wonderful results.

E. T. BAKER, D. V. M.

Moscow, Ia.

DISTEMPER IN HORSES

The nomenclature of that specific disease in horses and mules (to which all are at some time subject, though primarily affecting the young) is still very much confused. This same disease is termed shipping-fever, Influenza, Green Sickness, Pink Eye, Typhoid Fever, *Fievre Typhoide* by the French and *Pferdestaube* by the German. I have chosen name *distemper* for to me it seems more applicable than any of the others, for the reason that it closely follows the same general course of the disease which in other animals we term distemper.

There is no doubt but that there is a distinct disease of equine distemper, but probably owing to the fact that those engaged in general practice do not see the animal, until the primary infection has passed and the patient is in the first stages of a diseased condition produced by one or the other of the secondary invaders, that there is much variance as to the name.

The practice that I have been engaged in as veterinarian to the sales stable of Messrs E. D. & J. D. Stein, New York City, the past year has impressed upon my mind the fact that there is such a disease, and that it has a certain chain of symptoms; the important ones being high temperature, without a corresponding increased pulse rate (in fact the pulse seems remarkably full, strong and slow), intense depression, debility, weakness and usually complete loss of appetite as well as torpid condition of the bowels. These symptoms continue for three to five days when the temperature becomes about normal, appetite improves and the animal seems convalescing. As a rule, this is not so, but the systemic weakness of the animal, produced by the disease, has predisposed it to infection from one or the other of the pathogenic microorganisms, or what is termed a "secondary invader" and the animal rapidly develops a more serious condition and unless some specific treatment is administered, the case may rapidly terminate fatally.

This secondary attack is usually noticed first by the animal again refusing food, seeming dull and listless, respirations are increased and temperature again found considerably elevated; pulse rate increased and weaker; bowels assume typhoid character and in fact all symptoms of grave illness. While respirations are not accelerated to any extent, auscultation reveals areas of consolidation, with most frequently a pericarditis. These conditions rapidly become aggravated and unless the animal possesses a strong individual resistance, death occurs.

Under the old line treatment, fatalities were very frequent; and through the fall, winter and spring of 1911-1912, were especially so throughout the country. All known medicinal agents had been conscientiously tried, as well as the biologic preparations then obtainable. In May, 1912, Vaccine Equina was called to my attention and I obtained sufficient vaccine from the Comparative Vaccine Laboratories, Brooklyn, N. Y. to give their treatment a thorough trial.

The beneficial effect of this treatment could be observed within twenty-four hours. I could see improvement in all the cases, though some were very bad. All the animals showed some desire for food, temperatures, after a reactive rise (eight to sixteen hours after injection) were from 1° to 4° F., lower than previous to the injection; pulmonic distress not so marked, and pulse assumed a steadier rhythm. Those cases in the primary stage of distemper received only one more injection the third day and were discharged the fifth or sixth day. In a load of twenty horses there were eight cases of this type, of the remaining twelve, seven received a third injection and were discharged and the other five were given a fourth injection. These latter were of the type that previously would have been fatal; and of those treated, not one died, and every one rapidly convalesced with comparatively little loss of flesh even in the grave cases. This result could only have been attributed to the vaccine as I had abandoned practically all other therapeutic agents, aside from mild stimulants, (cardiac and respiratory) excepting a few cases where the kidney and intestinal involvement necessitated appropriate antiseptics, etc.

These results surely seemed marvelous but were undoubtedly secured and the same has been true for a full twelve months, during which time over 1000 horses have been handled by this concern. As each new carload brought some horses already seriously ill, I combatted this feature, by injecting a curative dose in every horse, as soon as received. The mild cases, being immediately under specific treatment, did not generally tend to show the secondary infections, and where secondary infections did develop they were of a lighter form; a fair percentage (about twenty-five percent) evidently securing sufficient immunity, as they remained free from the disease. The entire mortality, in any way due to distemper or complications, during this period (May 1911-May 1912) was five horses.

This method of using the vaccine on every new horse brought in (which I believe I originated) was of great economical value, not only in saving many cases from resulting fatally, but also necessitating the use of considerably less vaccine. I would also emphasize the fact that I was troubled with absolutely no abscess formation at site of injection, nor were there any evidences of any infection due to the use of this vaccine.

The results therefore possible in treating this disease, by means of this vaccine are first greatly lessened mortality; second materially shortened period of illness and convalescence; third, cases show very little loss of condition and are practically ready for sale, as soon as temperature becomes normal; fourth, economy (as records show the cost of vaccine and few medicinal agents used, is considerably less than under the old lines of treatment); fifth, ease of treatment, as surely the use of the vaccine where injections are usually made at three-day intervals is much simpler than the old way of giving a dose of medicine every few hours, especially when such noticeable results are secured within a short interval of time.

In conclusion I would emphasize the fact that experience has shown that much more certain and rapid results can be secured in this, and all the other specific diseases, by administering as little medicines as possible and absolutely abandoning the depressants, which latter inclued nearly all the febrifuges.

C. J. Cooper, V. S.

New York, N. Y.

WAUGHRAMS FROM PITTSBURGH

Dr. N. Rectenwald of this city has been using that same large trocar and canula for hoven in cattle as described by a Canadian practitioner recently in American Journal of Veterinary Medicine. A remarkable coincidence of the application of the same principles in different and remote parts of the country at the same time.

What are the pathological conditions existing in, and causing hypertrophy and induration of the tissues in the superior parts of the necks of some horses, mules and cattle, reaching from the pole to the withers, and involving all the tissues between the skin and ligamenta nuchae, and causing the superior part of neck to be as large as the inferior part, which sometimes assume a figure "S" shape or lop over to one side? I can not find it described in our veterinary literature.

What is the best method to cure those fibrous tumors in shoulders "due to neglected cold abscesses?"

Why do our English veterinary text books fail to describe hygroma of the withers?

Would a veterinary polyclinic school for graduates and other licensed practitioners succeed in North America? How can we ever sift the truth from the false statements made in our local veterinary association meetings? Of two graduates of the same university one reports all successes in the vaccination of 2000 swine and another reports all failures, using the same anti-hog cholera serum in Pennsylvania and the latter even got hog cholera in seemingly healthy herds where serum was used.

A country practitioner reported at a recent meeting that I attended more serum cures of equine tetanus than would be seen by an active city practitioner in a century of general practice. Better correct some evils!

Diseases of the Stomach and Intestines

(*Continued from page 600.*)

curette. Much patience and gentleness of manipulation is required to avoid injury to the walls of the rectum, but the operation must be repeated and persisted in until all the impacted mass is removed. After recovery the dog should be fed on lean meat, free from bones, milk, and beef tea. Regular exercise should be insisted upon and the animal given a good nerve tonic. In cases that do not yield to the above treatment laparotomy may be performed under rigid antiseptic precautions and if the condition of the impacted bowel allows, the mass gently broken up and pressed towards the rectum. If, however, the bowel is inflamed or necrotic, resection of the affected portion must be performed and the ends joined by either of the methods given in the description of that operation, which will be discussed in a later article. The prognosis, of course, is graver where resection has to be resorted to; still, recoveries do take place, and the operation should be tried in the effort to save the animal's life.

Typhlitis, or Inflammation of the Cecum

Typhlitis is of more frequent occurrence than is usually supposed. It is caused by constipation, indigestible foods or by micro-organisms. The symptoms are acute and persistent abdominal pain, especially after a meal. There is pain on pressure over the posterior portion of the abdomen and usually the swollen cecum can be felt through the abdominal walls.

Treatment.—All food must be withheld, and only water, or milk and lime water, allowed. A mild laxative to empty the bowels, assisted by rectal injection of oil or warm soapy water, should be administered. Morphine, gr. 1-4 hypodermically to relieve pain and hot applications to the abdominal region should be followed by gentle massage over the cecum. Should the above treatment fail to give relief in twelve hours, laparotomy must be performed with the usual precautions, and the cecum emptied by gentle massage. The after-treatment consists of rectal feeding for three or four days, when the patient may be allowed liquid food in small quantities till the abdominal wound is healed. The diet should be of an easily digestible and non-irritating nature for a fortnight longer, and bones should not be allowed for at least six weeks.

Enteritis, or Inflammation of the Bowels

Enteritis is an exceedingly fatal disease, and if at all extensive, recoveries are rare.

Cause.—Among the many causes leading to this grave condition are poisons, either chemical or bacterial; foreign bodies, intussusception, and intestinal parasites; consequently both symptoms and treatment will vary somewhat in accordance with the causative factor.

Symptoms.—In enteritis produced by poisons, the onset of the attack is sudden, the pain is continuous and severe, the abdomen exceedingly tender on pressure and in many cases tympanitic. Peristalsis may be completely in abeyance or there may be profuse and bloody diarrhea. Upon examination the lips, tongue and

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mucous membrane of the mouth and jaws are found to be intensely inflamed, sometimes eroded and hanging in shreds. There is great depression and a disposition to hide away in dark corners and secluded places. Convulsions may supervene, in one of which the animal may die, or it may gradually lapse into coma and die unconscious.

The treatment in these cases consists in emptying the stomach either by the stomach pump or with emetics (apomorphine, gr. 1-20 to 1-10), and in administering the suitable antidote to the poison. This having been done, the inflamed surfaces of the stomach and bowels must be soothed with demulcents such as barley water, linseed tea, marshmallow tea, etc., and protectives given, such as full doses of bismuth subnitrate. To relieve the agonizing pain hypodermics of morphine sulphate, gr. 1-4 to gr. 1 or the H-M-C tablets (No. 1) may be given as required.

Hot applications to the abdomen afford relief and if necessary the patient's strength should be supported with stimulants, such as ether or brandy administered hypodermically. In cases that respond to treatment and become convalescent the diet should be restricted at first to milk, gruel and beef tea. Later on very small quantities of soft and non-irritating food may be given.

Enteritis due to any of the causes above mentioned other than poisons, the attack usually comes on more slowly and as a sequel to other preliminary disorders. The animal becomes more depressed, the nose is hot and dry, the temperature extremely high, 105° to 107° F., and the pain continuous. The abdomen is tender, frequently tympanitic, and sometimes hard and tense. Peristalsis is absent and constipation obstinate. The thirst is intense, but the stomach is so irritable that vomiting is easily excited even by water. Symptoms of collapse appear, the pain abates, the pulse is barely perceptible, the mouth feels cold and clammy and the patient dies in coma or, more rarely, in convulsions. In all forms of enteritis extreme fear and apprehension are evident, the patient presenting a haggard, miserable and appealing appearance.

Treatment.—Enteritis following intussusception, impacted foreign bodies, etc., is almost invariably fatal; operation offers the only hope for recovery, and that is a most forlorn one. In other cases, however, anodynes and hot applications to the abdomen to relieve pain, with demulcents to protect and soothe the inflamed surface, enemas to gently solicit action of the bowels and stimulants as required, constitute the line of treatment to be followed. The after-treatment as regards diet is as before mentioned.

Neoplasms of the intestines in dogs are fortunately of rare occurrence, as the diagnosis is almost impossible, but their presence may be suspected in cases where the digestive functions are disturbed, and continual attacks of pain, especially after meals, and rapid emaciation ensue. Their presence may sometimes be diagnosed either by palpation through the abdominal walls in thin subjects or by the aid of the Roentgen rays. The varieties found are sarcomata and carcinomata.

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PERSONAL MENTION

DR. C. C. DAVIS died recently of dropsy, at his home in Ray, North Dakota.

—

DR. ALVA MURPHY of Muncie, Indiana, died September 20th, while on a visit to friends in Michigan.

—

DR. B. L. LOCKWOOD, formerly of Birmingham, Alabama, died recently at his home in Hazel Green.

—

DR. ADAMA A. KOEHLER died at his home in Louisville, Kentucky, September 22nd. Doctor Koehler was fifty-seven years old and leaves a widow and several children.

—

DR. GEORGE H. PETERS, during the past five years a practitioner at Waltham, Massachusetts, died recently at his home in that city, after a week's illness from pneumonia. Doctor Peters was thirty-two years old.

—

THE discovery has recently been made that the agricultural commission in the state of Ohio has no authority to prosecute unlicensed veterinarians for practicing in the state. The agricultural commission is the successor of the veterinary examining board, and this oversight on the part of the legislature leaves Ohio stockmen practically without protection from unqualified veterinarians.

—

DR. D. W. CRISWELL of Savanah, Missouri, has located for practice in Tarkio.

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DR. OTHO GORDON, during the past three years practicing at Wilbur, Nebraska, has located at Princeville, Illinois.

—

DR. W. C. LONG, a veterinarian at Bozeman, Montana, is under arrest for having shot and killed Dannie Coffey, a barber, in a dispute arising during a poker game.

—

DR. J. H. MILLER, dean of the division of college extension of the Kansas State Agricultural College, states that during 1912 Kansas lost nine and three-quarter million dollars' worth of livestock, two-thirds of which loss probably could have been saved by competent veterinarians. He goes on to say there is not a bigger or better field anywhere for trained veterinarians than Kansas offers.

—

DR. I. J. MURPHY, police surgeon and medical inspector of the health department of Duluth, Minnesota, has been trying a "painless destroyer" as a means of ridding the city of objectionable dogs, but doesn't like it. The agent used was dilute hydrocyanic acid, given hypodermically. It required five minutes to kill the dog, during which time the animal suffered greatly. Doctor Murphy now recommends shooting as the most humane method of killing dogs.

—

DR. J. R. DAWSON of Monroe City, Missouri, has found it necessary to provide increased facilities in the way of a well equipped hospital to meet the demands of his practice.

—

DR. C. G. VOLLMER, formerly an assistant to Dr. J. H. Blattenberg, of Lima, Ohio, has formed a partnership with Dr. Roy E. Davis. The new firm will continue the practice of Doctor Davis at his old address, 1320 Dorr Street, Toledo.

—

THE clinic in connection with the annual meeting of the Iowa Veterinary Medical Association, October 1st to 3rd, and held at the hospital of Dr. D. H. Miller of Council Bluffs, Iowa, is reported to have been an unusually good one. Much attention was given it by Omaha and Council Bluff papers.

—

ON PAGE 538 of the October issue, the examining board of South Dakota was incorrectly given. The members of the board are as follows: J. L. Barber, Tyndale; J. Phelps, Alexandria; Geo. C. Pilkington, Parker.

UTAH VETERINARIANS IN ANNUAL SESSION

The fourth annual meeting of the Utah Veterinary Medical Association was held in the Commercial Club building at Salt Lake City, Saturday, October 4th, 1913. The following resolution was adopted.

"Be it resolved that the Utah Veterinary Medical Association does hereby appeal to the state authorities that only qualified, graduate veterinarians be allowed to apply the tuberculin and mallein tests for all state and export purposes.

"And be it further resolved that a copy of this resolution be sent to the Governor of the State, the State Live Stock Inspector and the State Board of Sheep Commissioners."

The following officers were elected for the ensuing year: Dr. Elmer Crafts, American Fork, president; Dr. A. J. Webb, Ogden, vice president;

POLYVALENT CALF DYSENTERY SERUM

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GERM FREE DYSENTERIC BACILLI EXTRACT

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prevalent to so great an extent in valuable dairy herds.

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"Broken Wind," "Heaves," and all Bronchial affections successfully treated with

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"A precious therapeutic product."
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"The only product capable of ameliorating and curing that disease."
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"An energetic reconstituent * * * and dynamic tonic."
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Dr. E. P. Coburn, Brigham City, secretary and treasurer.

The outgoing officers were, Dr. Walter Emms, Salt Lake City, president; Dr. Arch Egbert, Logan, vice president; Dr. R. H. Hoggan, Richfield, secretary and treasurer.

Salt Lake City was selected for the semi-annual meeting to be held next spring and an interesting program is promised.

E. R. COBURN, D. V. M.

Brigham City, Utah.

DR. ISAAC W. ZELLERS, the oldest practicing veterinarian in Harrisburg, Pa., died at his home in Susquehanna Street, October 7th. Doctor Zellers was 74 years old and is survived by a widow and one daughter.

A LITTLE VARIETY

By Abe

A Michigan veterinarian was recently called to treat a horse belonging to a farmer who was inexperienced with the modern methods adopted by up-to-date veterinarians. The farmer was much interested when the doctor, after making his examination, proceeded to fill a gelatine capsule; but great was his consternation, when the aforesaid man of medicine dexterously opened the horse's mouth, withdrew the tongue and deposited the capsule so far back that the horse had to swallow it.

The farmer was momentarily rendered speechless, then, turning angrily to the veterinarian, exclaimed, "Se here, you darn fool horse doctor, are

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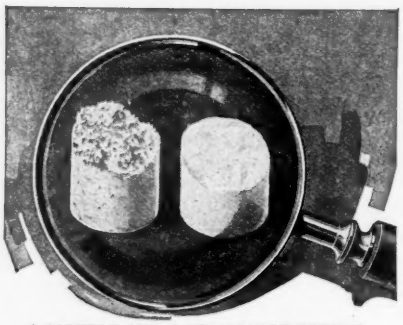

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you trying to kill my horse by giving him medicine bottle and all?"

—

Two young veterinarians from the same college were recently taking a state board examination. One of them found many of the questions perplexing and relied a great deal upon whispered conversations with the other, who gave him all the assistance possible, but the watchful eye of one of the examiners perceived him during one of his inquiries.

The examiner made straight for his desk and with ire in his eye and wrath in his voice said, "What were you asking of your friend?" Now "a soft answer turneth away wrath," especially if it is spiced with a little humor, and the offender meekly remarked, "I was simply trying to get enough information to pass your examination." The examiner passed on and strange to relate the aspirant was not molested in his further inquiries in search of knowledge, and is now the proud possessor of a certificate of registration.

—

In the sparsely settled districts of Kansas, where veterinarians are few and far between, there was recently a slight epizootic of a catarrhal nature among the horses, which is popularly known as "epizoodic." One farmer, noticing a slight discharge from his horse's nostrils, became a little anxious and concluded some treatment should be administered. Having an Indian neighbor, and sharing a fallacy common among many white people, that Indians are well versed in medical lore, and knowing that this Indian, whose name was Charlie Bear, had had a horse similarly affected about two weeks previously, he repaired to his shack in quest of information. Upon meeting his dusky neighbor the following conversation ensued.

"Say, Charlie, what did you give your horse when he had the epizoodic?"

"Tablespoonful aconite," was the laconic response.

The farmer of course administered the treatment, and it is needless to state with what results.

Upon meeting the redskin a few days later, he said, "Charlie, what did you say you gave your horse for the epizoodic?"

"Tablespoonful aconite," was the reply.

"Well," said the farmer, "I gave mine that, and it killed him."

"Ugh! killed mine, too," replied "Charlie."

QUESTION OF THE HOUR—THE HORSE

Number of horses in the United States January 1st, 1900, nearly 14,000,000.

Number of horses in the United States January 1st, 1909, nearly 30,000,000.

Increase in horse population past ten years, over 100 percent.

Average value of the horse in the United States, 1900, $44.61 each.

Average value of the horse in the United States, 1909, $95.64 each.

Increase in value per head past ten years, over 100 percent.

Total value of horses in the United States, 1900, nearly $1,000,000,000.

Total value of horses in the United States, January 1st, 1909, nearly $3,000,000,000.

Increase in value of horse population past ten years, 200 percent.

Is there any reason to doubt the horse is here to stay?—*The Carter-Luff Chemical Co.*, Hudson, N.Y.

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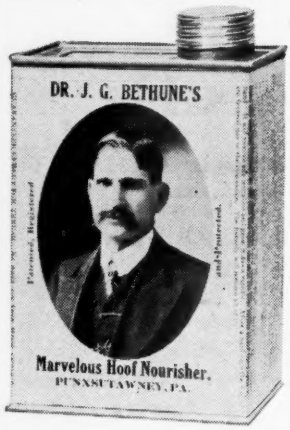

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It will stop any horse from rubbing his mane or tail if applied according to directions, to stimulate the growth of hair it has no equal.

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A Powerful Antiseptic, Disinfectant and Deodorizer.

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It is the only hoof remedy that does not contain grease or oil. All so-called hoof "dressings" and "ointments" are grease. Any remedy that will not mix with water, as all qualified Veterinarians know, should not be applied to a foot, for you all know that grease or oil fills up the pores and prevent the moisture from penetrating the foot.

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The Hoof Nourisher is fully guaranteed to do all that is claimed for it, or **your money refunded.**

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In all cases send P. O. money order, express order, or draft to

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Free sample of 8 ounces sent by Parcel Post on request.

What Dr. J. H. Danforth Says

Genoa, Ill., Oct. 5/13

Dr. J. G. Bethune,

Punxsutawney, Pa.

Dear Doctor:-I have received the five gallon can of Hoof Nourisher OK, I would not be without it in my practice if it cost twice as much.

The Hoof Nourisher sure makes a Pasture Field out of a dry stall when it comes to putting a set of hard and contracted feet in condition and keeping them normal. I have used several five gallon cans of your remedy as you know from the orders I send in, the Remedy will do all you claim for it and then some. Put an ad in the AMERICAN JOURNAL OF VETERINARY MEDICINE, so the Veterinarians can all see it, they do not know what they are missing by not using your Remedy, wishing you continued success, I am,

Yours truly,

J. H. Danforth, M.D.V.

The Diagnosis of Dourine by Compliment-Fixation

(*Continued from page 590*)

LEVADITI, C., and YAMANOUCHI, T. La Réaction des Lipoides dans les Trypanosomiases et les Spirilloses Experimentales. Bulletin de la Société Pathologie Exot que, Tome 1, No. 3, p. 140-144. Paris, 1908.

MANTEUFEL. Untersuchungen über Spezifische Agglomeration und Komplementbindung bei Trypanosomen und Spirochaeten. Arbeiten aus dem Kaiserlichen gesundheitsamte, Band 28, heft 1, p. 172-197. Berlin, March, 1908.

MANTEUFEL and WOITHE. Uber die Diagnostische Bedeutung der Komplementbindungsreaktion bei Trypanosomeninfektionen. Arbeiten aus dem Kaiserlichen Gesundheitsamte, Band 29, Heft 2, p. 452-477. Berlin, 1908.

MATTES, WILHELM. Agglutinationserscheinungen bei den Trypanosomen der Schlafkranheit, Nagana, Dourine, Beschälseuche, und des Kongoküstenfiebers. Centralblatt für Bakteriologie, etc., Abtailung I, Originale, Band 65, Heft 6-7, p. 538-573. Jena, Aug. 10, 1912.

MOHLER, JOHN R. Dourine. Report of Committee on Diseases. Proceedings of the American Veterinary Medical Association, 1912, p. 99-115, Lansing, Mich.

PAVLOSÉVICI. Recherches sur L'Application de la Methode Wassérmann, dans le Diagnostic de la Dourine. Archiva Veterinara, vol. 7, No. 2, p. 69-82. Bucharest, March-April, 1910.

SCHILLING, CLAUS, and HÖSSLIN, V. Trypanosomen--infektion und Komplementbindung. *Deutsche Medizinische Wochenschrift*, Jahrgang 34, No. 33, p. 1422-1425. Berlin, Aug. 13 1908.

WATSON, E. A. The Serum Reactions and Serum Diagnosis of Dourine. Proceedings of the American Veterinary Medical Association, 1912, p. 411-420. Lansing, 1913.

WEBER, HANS. Uber Immunisirungs-und Behandlungsversuche bei Trypanosomenkrankheiten. Zeitschrift für Experimentelle Pathologie und Therapie, Band 4, Heft 2, p. 576-626. Berlin, 1907.

WINKLER, and WYSCHELESSKY, S. Die Agglutination, Präzipitation, und Komplementbindung als Hilfsmittel zum Nachweis der Trypanosomenkrankheiten im besonderen der Beschälseuche. *Berliner Tierarztliche Wochenschrift*, Jahrgang 27, No. 51, p. 933-936. Berlin, Dec. 21, 1911.

ZWICK, and FISCHER. Untersuchungen über die Beschälseuche. Arbeiten aus dem Kaiserlichen Gesundheitsamte, Band 36 Heft 1, p. 1-103. Berlin, 1910

Report of the Special Committee for the Detection of Glanders

(*Continued from page 577.*)

The subcutaneous mallein test or injection of glanders antigen and vaccines may influence the ophthalmic mallein test. The ophthalmic mallein test should therefore

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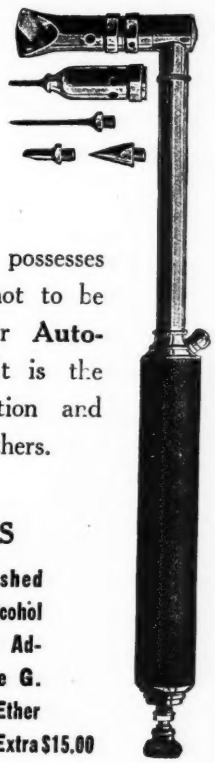

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be withheld for 30 days after application of the subcutaneous mallein.

Control

In the reduction of glanders all clinical cases should be immediately destroyed. All suspected and exposed animals should be tested and the positive reactors destroyed. The remaining contract horses held under restriction subject to further test after the expiration of at least 15 days. All infected premises should be thoroughly cleansed and disinfected.

All Interstate movements of horses, mules and asses should be regulated to include proper testing for glanders by the State or Federal Governments.

Compensation for clinical and occult cases should be provided for.

As this committee was obliged to confine its efforts to only a part of the outline of the proper consideration of the disease glanders in its entirety, we respectfully recommend for your consideration the advisability of the appointment of a permanent committee or commission to consider the subject as outlined in the beginning of the report submitted herewith.

E. B. ACKERMAN, Chairman

JOHN REICHEL, Secretary of Committee.
ADOLPH EICHHORN. C. D. MCGILVRAY.
CHARLES COTTON. CHARLES KEANE.

Technically what are water seeds? How removed?

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Has anyone used with success the hypophosphites in treatment of pyemic arthritis in foals?

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Does one grain of arecoline combined with half a grain of strychnine act more severely on cows than horses?

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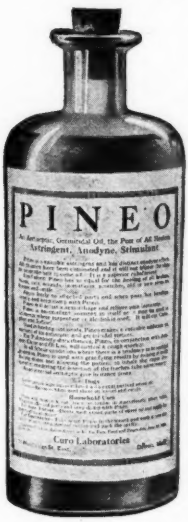

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Ship gallon of Pineo at once.—Dr. G. H., N. Y.

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Pineo is satisfactory.—Dr. R. F., Conn.

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Curo Specialties are all you claim.—Dr. G. H. L., Pa.

I am well pleased with the results of Pineo.—Dr. F. C. H., Ill.

Have had good results from the use of Curo Specialties.—Dr. S., Ill.

Your sample of Pineo is fine. If all is as good will use more.—Dr. W. C. McM., N. C.

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A pointer dog belonging to a man in Nashville was lost, and the owner suspected that it had been stolen, so he put this notice in the paper, and insisted that it be printed as he had written it:

"Lost or Run Away.—One liver colored burd dog named Jim. Will show signs of hiderfobby in three days."

The dog came home the following day.

—*The Farmer's Guide.*

TESTS FOR MILK ADULTERATION

It is not difficult to test milk, to see whether it has been adulterated with water or colored to make it appear richer than it really is. It doesn't require a chemist or highly trained scientific man to determine whether milk is pure or not. It takes a chemist, of course, to tell us how, but after that any bright man, woman or high school girl should be able to do so.

Milk is adulterated most frequently by adding water to it. To detect water in milk a lactometer is necessary. Place about a pint of milk in a wide mouthed jar. Take the temperature. If the temperature of the milk is about 60 degrees the lactometer may be inserted. Be sure that the lactometer floats in the milk. Then read the lactometer. If the milk is of average richness, and has been neither watered nor skimmed, the scale should be somewhere between 1.027 and 1.033. If the scale is less than 1.027 and the milk is watery blue, the water has been added; if the reading is less, and the color of the milk is creamy, it may be unusually rich milk. No decision should be made until the tests for coloring have been made. It may be watered milk which is colored, for these two meth-

Anti-Hog Cholera Serum

We wish to announce that the Ames Vaccine Company has moved its office and plant from Ames to Fort Dodge, Iowa, where we are building a plant which, when completed, will be the most sanitary and up-to-date plant of its kind in existence.

We will keep our serum up to the highest standard of potency, which reputation it has earned in the past. We do not buy sick hogs on the market, which are frequently affected with mixed infections and different stages of diseases from which to make our serum.

We buy only healthy pigs that we know are susceptible, these pigs are inoculated with a virulent strain of cholera virus that has been bred up for a number of years and is known to be free from mixed infections.

We do not sell to farmers, *jobbers* or *druggists*. We sell *only* to veterinarians.

AMES VACCINE COMPANY

FORT DODGE, IOWA

ods of deception are naturally apt to appear in the same sample of milk. If the scale reads over 1.033 the milk has not been watered, but it has been skimmed.

The tests for artificially colored milk are of two kinds, as two different articles are generally used for the coloring. These are coal tar dye, which is usually harmful, and annotto, a yellowish red dye obtained from the pulp enclosing the seeds of the annotto tree of Central America, a tree of the Indian plum family. This is not injurious to health, and so it is frequently used to make skimmed or watered milk look rich.

To test for coal tar dye, place a small quantity of milk in a testing tube. Add an equal amount of hydrochloric acid. Shake thoroughly. If the

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milk is colored with coal tar dye the mixture will turn pink.

To test for annotto, make your experiment in a room where there is no fire, place a teaspoonful of milk in a test tube. Add an equal spoonful of ether. Shake well. The liquids will separate. Pour the upper one into a teacup, and set the teacup into hot water. Add to the residue a few drops of ammonia, and pour out on a small, wet piece of filter paper. The fat from the milk will collect on the top of the paper, while the annotto, if present, will fill the pores of the paper like water. Wash off the fat gently. If annotto is present the paper will show an orange tint.

These are absolutely sure methods of detecting the presence of this foreign coloring matter in milk, if the instructions and directions are followed carefully.—ISAAC MOTES, in *The Farmers' Guide.*

Agricultural Bulletins

(*Continued from page 592*)

Wyoming Agricultural Experiment Station, Laramie. This bulletin gives a description of the life history of the *Melophagus ovinus*, with a discussion of diseases important to the sheep raising industry of Wyoming.

—

METHYLENE BLUE, A REMEDY FOR INFECTIOUS ABORTION, by F. A. Rich, Vermont Agricultural Experiment Station, Burlington, Bulletin No. 174. In this bulletin the author records the treatment of contagious abortion with methylene blue, in four herds, during a period of one year. The time which has elapsed since treatment began seems insufficient to allow one to arrive at definite conclusions in regard to this treatment, but the investigations so far made, seem to indicate that methylene blue is a specific for contagious abortion in cattle. It was administered in doses of ten drams twice daily.

—

LIVE STOCK LAWS OF PENNSYLVANIA. A transcript of an act passed by the recent legislature, relating to domestic animals; defining domestic animals so as to include poultry; providing methods of improving the quality thereof, and of preventing, controlling, and eradicating diseases thereof; imposing certain duties upon practitioners of veterinary medicine in Pennsylvania; regulating the manufacture, use and sale of tuberculin, mallein, and other biological products for use with domestic animals; defining the powers and duties of the State

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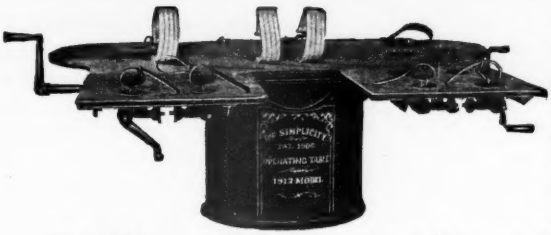

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DR. N. D. BACKUS.

Elyria, Ohio, Dec. 11, 1912.

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PROCEEDINGS OF THE WASHINGTON STATE VETERINARY MEDICAL ASSOCIATION, by Carl Cozier, Secretary, Bellingham, Washington. This pamphlet contains the papers read at the fifth annual meeting of the Washington State Veterinary Medical Association, at Wenatchee, June 19th and 20th, 1913, together with the secretary's annual report and a list of the licensed graduates in the state and their addresses. Among other papers it gives the following: Importance of Laboratory Diagnosis in Veterinary Practice, by J. W. Kalkus; Canine Rabies—Hydrophobia, by J. T. Seely.

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PROCEEDINGS OF THE SEMI-ANNUAL MEETING OF THE COLORADO VETERINARY MEDICAL ASSOCIATION. This pamphlet contains the president's address, the papers,

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and a description of the clinic of the meeting of the Colorado Veterinary Medical Association, held in Fort Collins, May 28, 29, 1913.

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THE ALUMNUS, a monthly publication issued by the Kansas City Veterinary College, beginning with July, 1913. The contents of the *Alumnus* is of interest chiefly to the graduates of the K. C. V. C. Volume I, No. 1, contains an important study of "The Equine Meninges with some Pathologic Alterations, by S. L. Stewart '06."

—

THE PRINCIPLES OF HORSE SHOEING, by David W. Cochran. A reprint of an article originally published in the June issue of the Cornell Veterinarian, in which the subject of lameness is discussed in the usual comprehensive style of the author, from whom copies of this reprint may probably be had.

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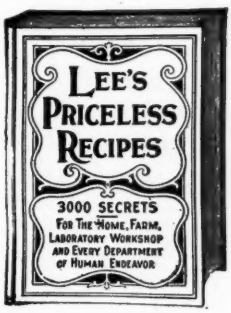

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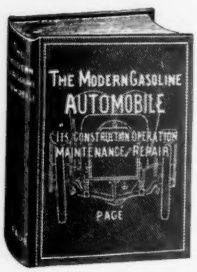

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A LAY VIEW ON FELINE PRACTICE

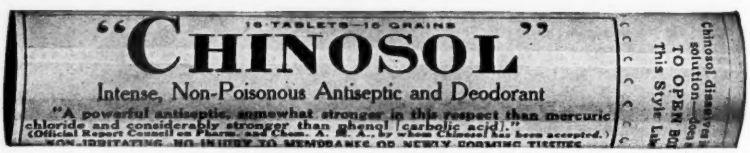
As I have had over seventy male cats neutered in my cattery during the past five years, and have with my own hands held over thirty for the veterinary to perform the operation, I feel that I may speak with some authority. These cats have ranged in age from six months to six years, but the latter cat lived a completely isolated life, so far as other cats were concerned, until he came to me, and was exceptional. The operation, to be most successful and least painful to the animal, should be done at seven or eight months of age. Great pains should be taken to keep the cat from his kind. A cool day should be selected; a skillful and rapidly working veterinarian should be selected; some one who can rely upon his nerves and the grip in his hands should hold the cat; the knife should be sharp and perfectly sterile; and I will guarantee that within twenty-four hours healing will be practically complete. There is just one place to make the incision in the little furry sack, and the cord must be drawn out as far as possible, clipped off, and allowed to spring back and tie itself. I have helped in this operation when there were not more than three drops of blood on knife, table, and organs removed. Again, they bleed freely, but loss of blood is always loss of strength, and it is usually the older cats that bleed to any extent. A cat of eight months will take entire care of himself, will eat within three hours, and play as usual within five hours. Some, of course, are more nervous than others, and recovery is delayed. One cat actually died because he was so aggrieved at being hurt, that he grieved himself to death, as the autopsy showed no reason for death. It is important to get the whole length of the cord because, in her determination to perpetuate the species, nature provides all male animals with an embryo set of these organs which grow in case of injury to the normal ones. This accounts for unclean habits coming upon neuters that have been perfectly trustworthy for years—the embryo grows, natural methods prevail, and the cat is called "dirty," not being at all to blame.

I want to emphasize the necessity for having a reliable veterinarian perform the operation, as people sometimes let farmers or friends who have operated on various domestic animals do the work, and these men sometimes cut away the entire sack, disfiguring the cat and leaving the nerve center there entirely unprotected. It may cost more, but it is worth something to have it all over within a minute, and the cat all right the next day.

I was simply driven to hold the cats for my veterinarian, from motives of anxiety for the cat and desire to know just what ought to be done. Most assistants choke the cat to stop its cries and struggles, but I have never found it necessary to hurt the cat's body in any way. I have been scratched and bitten several times, but cat scratches and bites have no terrors for me, and I never wear gloves.

Our worm tablets contain santonin, calomel, oil of wormseed and extract of pink root and senna. We give two tablets, and follow in five or six hours by a five-grain cascara tablet. Or, if kittens, give a good dose of olive oil. Repeat in forty-eight hours, follow with cathartic, and give again in a week, making three treatments in all. I have seen live worms pass from a three-months-old kitten after the first dose.—HENRIETTA K. DE VOE, in *The Cat Review*.

CANKER OF THE EAR
PROMPTLY CURED BY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Intense, Non-Poisonous Antiseptic and Deodorant
"A powerful antiseptic, somewhat stronger in this respect than mercuric chloride and considerably stronger than phenol (carbolic acid)."
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DIRECTIONS

Dissolve one tablet Chinosol in one pint of hot water.
Place the animal on its side, hold the ear open wide, fill the ear to the rim with this solution. Hold the animal still for thirty seconds, then let it get up.
Then treat the other ear in a similar manner.
The disagreeable odor is instantly destroyed and if this performance is repeated two days in succession, the result will speak for itself.
No damage whatever to the animal.

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